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International Labour Office

METHODOLOGY OF MANPOWER FORECASTING

By International Labour Office

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Introduction

(1) What precisely are manpower requirements for economic development? And for what purposes are forecasts of these requirements needed? Consideration of these questions appears to be an essential preliminary to a discussion of the methods by which such assessments may be made in the practical situation.

(2) The process of economic development is not usually found to be operating throughout the whole of an underdeveloped economy. Although in some areas the demarcation line may not be very clear, as a rule it is possible to identify a modern or modernising sector, which may cover a wide range of industrial activities including agriculture, where more advanced methods of organisation, capital or techniques are being introduced, are in use or are being added to, and where manpower with education and/or occupational skills is required and is often in short supply; and a traditional sector where traditional technologies are used, where labour-capital ratios are high, and where skills are elementary or obtained by traditional methods. Assessment of manpower requirements is particularly relevant in the modern sector, which covers the greater part of employment of non-traditional skills.

(3) Another consideration is that information about manpower requirements cannot, in isolation, be placed to very useful purpose. The significant data are manpower requirements in relation to manpower resources, i.e. manpower surpluses or shortages. Such data are needed mainly on (a) the total manpower surplus or shortage, in order to determine the desirable employment impact of economic development; and (b) shortages or surpluses of manpower having certain occupational skills and educational levels, in order to test the feasibility of a planned or expected rate and type of economic development, as part of the basis for measures to change the occupational and educational pattern of the manpower available, or alternatively to change the rate and type of economic development. The present paper deals with the latter aspect and methods for making such assessments.

(4) The time period for which information is required is also pertinent. Thus, forecasts a few years ahead are needed to make decisions about the numbers to be guided into training for various types of occupations; to assess the number of scholarships to be given for training for various occupations in institutions at home or abroad; to assess the need for accelerated training courses; to vary the type of vocational training available locally; or to make changes in the phasing and geographic distribution of economic development. And forecasts about the long-term future are required as a basis for broad educational and vocational training planning, including decisions on educational capital investment and the training of educators and if necessary to recast long-range economic development plans in light of the possibilities of the future manpower situation.

(5) A last consideration relates to the degree of precision necessary in assessment. This tends to fall as the period of the forecast extends into the future. While relatively precise data are required about the short-term future, as the basis for specific operating decisions, somewhat less precision in longer-term forecasts can be tolerated, because they are used to influence broad patterns of development and the lines of action can often be varied or precised as the situation progresses. This points, however, to the need for regular review of long-term forecasts so that they may be adjusted as the future unfolds.

I. FORECASTING MANPOWER REQUIREMENTS

The Development of Labour Input Coefficients

(6) Experiences made in some countries to forecast future manpower requirements or requirements for high-level personnel on the basis of expectations of employing establishments regarding their future manpower demand have shown the lack of reliability of this method, even over short periods ahead. It is increasingly accepted, therefore, that such forecasts need to be related to future economic growth, through the application of suitable labour input coefficients to planned or expected output in various economic activities. Obviously, the narrower the classification of activities for which output forecasts are made or output targets fixed, the more industry-specific will be the labour coefficients applied and hence the more accurate the forecasts of requirements.

(7) The development of labour input coefficients showing the occupational composition and the proportion of manpower in significant occupations for each economic activity, and relating them to output, therefore, seems to be the crux in preparing forecasts of manpower requirements. There appears to be no alternative but to make forecasts of future coefficients, initially, on

the basis of current coefficients. To calculate these, various sources may be used. The census often provides information on the industrial-occupational distribution of the labour force in the economy as a whole, although it may sometimes be necessary to go to census tabulations to extract these. Between census periods measurements can be obtained from labour force sample surveys, but because of limitations imposed by sampling techniques, only for very broad industrial and occupational classifications. In contrast, data from establishment inquiries, supplemented where necessary by data about the skilled self-employed, can be organised to provide industrial-occupational analyses at almost any degree of detail of classification. Data from establishment inquiries normally relate to the modern sector of the economy chiefly, but this may not be a major drawback, since as we have seen it is in that modern sector that skilled and high-level personnel are mainly concentrated. Moreover, establishment inquiries, particularly when conducted in part by interview, are a source of information on many of the factors influencing manpower distribution and utilisation, e.g. the types of equipment used, etc. Such information is essential in interpreting current labour coefficients and adjusting them for the future. In making these adjustments the manpower forecaster is confronted with certain problems and must keep in mind certain considerations which may be summarised here.

(8) Manpower supply effects. The pattern of current employment is not independent of the manpower currently available and adjustments on this account to current labour input coefficients have to be made before they can be used as a basis for forecasting. In particular, shortages of skilled manpower may cause employing establishments to have a less efficient arrangement of work and consequently occupational pattern from that which would obtain if manpower with the required skills were available. Judgments about the extent to which this is happening may be made on the basis of changes establishments indicate they would make should manpower with different skills become available. However, this information has to be checked through research: establishments may have become so used to making do without the required complement of skilled manpower that the current occupational pattern may appear normal to them.

(9) More reliable information may be obtained where significant differences in occupational patterns occur in establishments with similar technologies in the same locality, indicating that different manpower supply effects are operating: sometimes it is possible to identify employing establishments which for various reasons are preferred by the scarce trained manpower available and where, consequently, the occupational structure is more a result of manpower demand than manpower supply influences. The extent of manpower supply effects can also be gauged by comparison of local occupational patterns with those found in establishments with similar technologies operating in countries where skilled manpower is not in short supply.

(10) Changes in technologies. Current labour input coefficients for each economic activity have also to be adjusted to allow for likely changes in technologies over the forecast period. In countries where economic development planning takes place, the output plans will have taken into account the likely future capital-output ratios; and the technological assumptions of economic development planning and manpower forecasting have to be co-ordinated.

(11) If, however, no information is available on the technological changes to be introduced, the manpower forecaster must try to determine them himself. Generally the impact of changing technologies upon labour input coefficients might be predicted by extrapolating past trends, and possibly adjusting them by some coefficient to take into account a particular growth path which has been accepted by the country concerned. However, data on past trends are rarely available, particularly in developing countries, and at the present stage of research a more disaggregated approach may be preferable. Some suggestions are made in the following paragraphs.

(12) It appears likely that the imponderables might be significantly reduced and research facilitated if separate forecasts are made for the modern and the traditional sector. For the traditional sector forecasts it might often be sufficient simply to use current undifferentiated labour coefficients; this would of course involve the assumption that ratios between the labour inputs and other inputs will remain constantly high and input-output ratios low. Where processes are operating which are likely to change coefficients in the traditional sector significantly, e.g. instruction in improved farming methods or increase of transport facilities or other external economies, it is necessary to undertake research in an attempt to make adjustments to them.

(13) Establishment inquiries provide a vehicle for obtaining information about current technologies in establishments in the modern sector as well as about the manpower associated with them; and this provides a basis for predicting change. In establishments with higher capital-output ratios, technologies tend to remain relatively unchanged at least until the capital is substantially replaced. The life of the capital is determined, particularly in lesser developed economies, largely by rising maintenance costs as it ages, although changes in the factor and commodity markets are also pertinent. With regard to the capital likely to be replaced during the forecast period and the incremental part of the forecast capacity, technological expectations have to be formulated.

(14) In doing so government policies may provide guides. In some activities labour-intensive methods of production may be fostered: for example feed-back devices, transfer machines, automated office equipment, production lines or mechanical earth-moving and road-making equipment may be discouraged. In some

other activities, low labour input-output ratios may be tolerated or even encouraged where they are necessary to achieve high capital-output ratios and thus the greatest return on scarce investments. In other activities still, countries may be endeavouring to develop entirely new types of technologies that are more suited to their needs.

(15) Where technologies are not controlled the more profitable tend to develop (subject to the availability of capital), especially where products are in competition with those of other countries. In the absence of data on which to assess the relative profitability of different technologies, it may be sufficient to assume that the more advanced technologies found in existing employing establishments are also the more profitable; or, in economic activities new to the country, those used abroad which are consistent with the inputs likely to be available locally.

(16) In some activities there is no alternative to high labour-capital ratios and substitution between labour and capital is not significant. These include administrative and professional services which are large employers of highly skilled manpower. However, in many service activities there may be a discernible sequence in the technical specialisation of manpower required: the elementary techniques may tend to be adopted before the more advanced (e.g. general dental practitioners may be expected to precede exodontists); in many cases the adoption of one set of techniques must be associated with others (e.g. general banking services and central banking); and the adoption of some techniques depends upon the types of manufacturing, construction and farming activities being developed (e.g. consulting engineering and architectural services and agricultural departments).

(17) Changing efficiency. In adjusting labour input-output coefficients allowances must also be made for changes in efficiency coming from such factors as external economies, improvements in skills and improvements in the organisational structure of establishments and managerial methods. In fact some of these changes can be more significant quantitatively than those coming from technological considerations. There appears to be a need for the development of indices on the basis of which changes in the efficiency of establishments can be taken into account.

Some Special Considerations Applying to Short-Term Forecasts

(18) It is clear from what precedes that, even though research will gradually increase the reliability of labour input coefficients by throwing light on the factors that cause them to change over time, it will probably never be possible to predict accurately the exact course of these factors, and hence there will always be some margin of error. Although in long-term forecasts the margin of error will tend to increase, it would

appear that this would not be too important since in most cases it would be sufficient for such forecasts to give broad indications as a basis for determining the main lines of educational and training policies, rather than for specific target-setting regarding the output of various educational and training institutions.

(19) Short-term forecasts, on the other hand, are used for the latter purpose but fortunately also the imponderables are reduced: in the short term not only is it likely that there will be plans covering a fairly broad area of the determinants of manpower requirements, but access is available in many cases to concrete investment and technological proposals. Several methods of identifying such proposals are available. Establishment inquiries can be used amongst existing employing establishments in the government and private sectors. Information about new private establishments likely to be set up can be obtained from records of industrial development or other authorities. In addition, there will often be programmes indicating public works to be undertaken or government services to be provided, or setting capacity targets for certain activities, e.g. for certain manufacturing activities, for a certain density of medical practitioners in the population, for certain tourist facilities, for certain water reticulation standards. Moreover, where actual projects are being considered the types of manpower that will be required can be judged from the capital equipment to be used or, with regard to services, the techniques involved.

(20) Such plans or proposals are rarely comprehensive for the whole economy. They may also be insufficiently co-ordinated and lack consistency either among themselves or in relation to actual economic potentialities and needs. They must, therefore, be used with caution. But if examined critically they can provide a basis for adjusting and precisising the manpower forecasts based on macro-economic forecasts of future production, and they help in determining areas for priority action in the manpower field.

Forecasts of Educational Requirements

(21) The pattern of educational levels likely to be required at the workplaces by a future labour force has to take into account the likely occupational distribution of that labour force. To relate the occupational pattern to education, an index has to be drawn up indicating the types and levels of education which are currently, or are in future likely to be, regarded as a necessary preliminary to entry to occupations. On this basis occupations can be grouped in such a way that each group includes only occupations for which the same type and level of education is a prerequisite. In forecasting educational requirements, however, allowance must be made for the fact that as long as the supply of manpower with the required

educational qualifications will be inadequate - a situation which prevails in most developing countries - there will be great flexibility in the application of criteria for admitting workers on the basis of their educational attainments. The manpower fore-caster in formulating educational requirements will therefore need to phase them in such a way as to allow for a gradual rise in the qualifications of manpower wherever necessary.

II. FORECASTING MANPOWER RESOURCES

(22) Changes in the occupational pattern of the more highly skilled labour force are determined largely by training at home or abroad; the migration of qualified persons; wastage from the occupation because of death, permanent illness, marriage or retirement from the labour force; and transfers to and from other occupations.

(23) For professions and technical occupations and crafts where institutional training or apprenticeship is a usual pre-requisite, the likely increment can be estimated for a number of years ahead equal to the length of the formal training period, on the basis of the number studying for qualification in the occupation in each academic year, and the failure and wastage rate. With regard to institutions abroad, estimated future outflows of qualifying nationals have to be adjusted to allow for those not likely to return to their home country to work. The causes of such wastage need to be studied not only in order to improve forecasting, but also as a basis for corrective measures.

(24) If forecasts of the labour force by occupational categories are further ahead than the length of the training period, an added factor for estimation is the likely training intake. Where training is obtained principally in institutions, the upper limit of future intakes is set by the future number of training places forecast. Assumptions about the extent to which the places will be taken up need, of course, to be consistent with forecasts of persons attaining the required educational level. Estimates of future training of nationals in institutions outside the country can be based partly upon the number of government and other scholarships planned for this purpose. Allowance has to be made for non-scholarship training abroad, and, particularly if local training facilities are expanding, past trends have to be adjusted in doing this. With regard to apprenticeship and other training where there is a recognised "on-the-job" training period, estimates of future training intakes must take into account the availability of qualified craftsmen to provide such training and suitable ratios between qualified workers and trainees.

(25) In skilled occupations where there is no recognised period of training, but where entry is usually by progression through an organisational or occupational hierarchy (e.g. certain administrative occupations) assessments of growth, even if they could be made with precision, are probably superfluous. It is probably

more important to assess the quality of such workers at various hierarchical levels, with a view to determining needs for improving basic educational facilities or for managerial development or other training courses.

(26) Any attempt to forecast migration must take into account government attitudes towards immigration, which may be fostered or accepted for certain occupations but discouraged for others. Consideration must also be given to the extent to which skilled workers and high-level personnel are likely to accompany direct foreign investment. Trends in the emigration of skilled nationals and likely changes in government policies towards this type of emigration and the possible impact of increasing employment opportunities in their home countries have to be taken into account. Forecasts also involve judgments about changes in policies which influence the tenure of skilled or high-level expatriates.

(27) Persons leave the labour force principally because of death, age, marriage or permanent illness. If vital statistics show deaths classified by age and occupation of the deceased they may be used in forecasting losses due to death in future years in individual occupations; they can be adjusted, if necessary, for expected changes in death rates over the forecast period. However, such detailed statistics are rarely available in developing countries, and death rates for the population as a whole will probably have to be used. For high-level occupations, these may need to be adjusted having regard to the fact that people in these occupations usually enjoy better living conditions and have a higher life expectancy than the rest of the population. Similarly, retirements can be estimated by applying the average retiring age in the country, but research may show for manpower in the more highly skilled occupations significant departures from this average. Loss because of illness or marriage can only be allowed for on the findings of research.

(28) It appears likely that transfers between the more highly skilled occupations comes principally from upgrading. The extent to which this is current can be assessed from establishment inquiry data: its incidence in the future will obviously be influenced by the relative availabilities of manpower in the occupations concerned.

III. COMPARISON OF MANPOWER REQUIREMENTS AND RESOURCES

(29) The forecasting of manpower shortages and surpluses involves a preliminary comparison of forecast requirements and resources, to obtain a first indication of the likely future situation. In the light of this, assumptions that had been made about many of the unplanned elements in the forecast of manpower requirements and resources (e.g. technological

assumptions, the extent of upgrading, the migration of skill, the return of nationals on completion of training abroad) may need to be revised since these factors may be influenced by the actual development of labour supply and demand in individual occupations. Thus, by a process of gradual refinement and adjustment, final forecasts of manpower shortages and surpluses are made.

(30) Obviously, when on the basis of these forecasts changes are made in current plans or policies, these changes need to be studied in order to determine all their possible repercussions on future manpower situation, i.e. the forecast must be revised.

(31) In practice, the process of comparing manpower requirements and resources cannot be a precise one. Even where there are comprehensive manpower measurements and forecasts, data seldom dovetail closely (there usually are differences in coverage, in classification, in time periods to which data relate) and the reliability of data varies. Imprecision can be reduced to an extent by good measurement techniques, the use of uniform industrial and other classifications, and attention to the timing of measurements.

(32) Comparisons by occupational categories are usually required for many, perhaps most, professional and technical occupations and also for many crafts and other skilled occupations. The degree of precision of assessment will have to be greater for the more highly skilled occupations because institutional training has to be planned well ahead and, for these workers, occupational mobility is likely to be fairly low outside the occupational functions for which their education fits them. However, as we have seen, even for those categories the breadth of occupational classification for which assessment needs to be made tends to increase with the period forecast.

(33) Requirements for workers in skilled occupations can be assessed for each geographic area and industry for the short and long-term future to the extent that output can be forecast for regions. However, future manpower resources cannot be allocated between industries and geographic areas: where over-all shortages exist, the available workers will tend to enter those establishments which offer the greatest net advantage in employment.

(34) In forecasts for a specific occupation there may sometimes be a need to allow for a frictional imbalance, and the likely development of the employment service may need to be taken into account in doing this, since it is likely to reduce such imbalances.

IV. INTERPRETATION OF MANPOWER FORECASTS

(35) Apart from their intrinsic limitations, forecasts of the manpower likely to be required and available for economic development cannot be expected to materialise to any greater extent than the plans and expectations upon which they are based.

In the practical situation these are subject to continual review and variation; moreover, unforeseen influences are constantly changing the size and composition of the manpower resources. Manpower forecasts must be interpreted on the basis of the likely reliability of the data on which they are formed, and this involves the extent to which the ever-changing data are incorporated in revised forecasts.

(36) Also forecasts must be interpreted not with regard to an isolated point of time, but taking into account the current and shorter-term situation leading up to the forecast date. Obviously skilled manpower resources cannot to any significant extent be stockpiled awaiting the development of forecast requirements; the process of balancing manpower requirements and resources is essentially one of balancing their flow over a period of time. Forecasts of the manpower likely to be required and available for economic development have also to be interpreted remembering that the short-term demand situation is likely to vary over the period to which forecasts apply.



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Agenda Item: B.3

United Kingdom

THE ADMINISTRATIVE STAFF COLLEGE
IN THE UNITED KINGDOM
AND IN THE DEVELOPING COUNTRIES

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THE ADMINISTRATIVE STAFF COLLEGE IN THE
UNITED KINGDOM AND IN THE DEVELOPING COUNTRIES

by

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INTRODUCTION

1. Problems of war provoked much new thinking and a readiness for boldness in solving them, often bringing to bear the joint efforts of those who in peacetime tended to move in different spheres of life. In particular, those having to administer the United Kingdom's war machine and those responsible for the running of industry were brought into close contact with each other, while many in the academic world took up posts of senior responsibility in an advisory or executive capacity in government, in the civil service, in the armed forces.

2. A small group of eminent industrialists, educationalists and public servants met informally during the war to discuss the issues likely to face the country when peace came, and some of the lessons to be learned from the experience of war. One of the clearest of lessons was that there would be a continuing need for mutual understanding amongst those holding posts of responsibility, whatever their walk of life, and that educational experiment was called for in enabling already mature and experienced executives to acquire the subtle skills of higher administration. Their discussions took form with the decision in 1946 to found a College which would bring together men and women of ability and promise from industry, commerce, the trade unions and all forms of public service, as a means of fostering understanding between those carrying responsibility in differing spheres - the aspect singled out in the report of a previous United Nations Seminar which commended examination of the experience of the Staff Colleges in Australia, U.K. and India. (1) The decision was taken only after close consultation with leading personalities in many walks of life, a preparatory phase which was invaluable in clarifying the pre-conditions for success of such an institution. The College was established as an independent body, non-profit making, deriving most of its income from fees, the balance from voluntary subscription.

3. The first Principal, Mr. (now Sir) Noel Hall, was appointed in 1946. In 1960 he was elected Principal of Brasenose College, Oxford. Sir Noel Hall

- (1) Public Industrial Management in Asia and the Far East; a selection from the material prepared for a United Nations Seminar held in New Delhi in December 1959; Department of Economic & Social Affairs, United Nations (1960) ST/TAO/M15 - para. 52.

there was responsible for the College's first fifteen years of life and it is he who can be regarded as the architect of the Henley course. The manner in which the Henley conception was evolved, the working out of its distinctive characteristics, must be largely attributed to him. In February of 1958 Sir Noel Hall was invited to be the first Ford Distinguished Visiting Professor at the School of Commerce, Accounts and Finance of New York University. On this occasion, in the course of three lectures (2) he expounded upon the various stages which make up the continuing process of management development, the problems of developing higher executives, and the nature of 'The Henley experiment'. Those with a special interest in management development would be well advised to read Sir Noel Hall's lectures.

OBJECTIVES AND COURSE DESIGN

4. The object of the College, defined a little more closely, is to provide an opportunity for those who have had ten to fifteen years of experience and are soon to have higher responsibilities, to reflect on their past experience and achievement and to consider their future within a course of studies designed to make them think about the main issues which confront those in important positions. Given this objective, a number of implications follow.

5. The emphasis should be on improving practice and the application of knowledge, rather than on theory and the disinterested advance of knowledge. Not that there is a sharp dividing line, but there are important differences. Given the calibre of participants and the College's aims, the approach must be founded upon active participation rather than on more traditional academic methods and teacher-student relationships. On the view that the comparative method is the most fruitful, the College should exploit the varied experience of participants, perhaps the College's richest asset. On any one session, there are 66 participants who are selected to represent between them a cross-section of the working life of the community and of the various functional areas of administration. It was judged at the outset that the College could not hope to attract the kind of participant in mind if the course of studies were longer than three months. This period was determined in the light of what was thought feasible at the time, but assuming a fresh start today and the possibility of a longer period it is doubtful if one would come to a very different answer.

6. Since attendance at Henley would happen only once in a lifetime and at a critical juncture in a man's career, it was important that the content and method should serve participants' longer-term needs and the changing nature of their work when they come to acquire wider and more senior managerial responsibilities. Here one has in mind the feel for broader issues so that a man gets away from his specialism and a preoccupation with detail, the skilful use of experts, effective delegation, the skills of oral and written communication and a readiness to take timely decisions.

- (2) Sir Noel F. Hall: The Making of Higher Executives: The Modern Challenges, New York University (1958)

7. The criteria governing the selection of participants are critical. Those considered for nomination must first meet the College's conditions regarding experience, age, prospects and general ability. They must genuinely want to come to Henley. Final selection is by competitive interview.
8. Given such objectives, an original approach was necessary in the design of the course of studies, its content and method.
9. The period of three months suggested that the right number to bring together on any one session was about sixty. Participants must have time to get to know each other and to work together in syndicate and in full session. There must be time for the staff to get to know them.
10. With participants a very mixed group and selection primarily by the criterion of experience rather than of educational attainment, appropriate teaching methods must be devised. Half the participants happen to hold a university degree or similar qualification, a proportion which can be expected to grow, but experience would still remain the cardinal test for selection, and teaching methods would reflect this.
11. The emphasis on individual responsibility and active participation combined with the need to work co-operatively, - the situation in higher management, - gave rise to the syndicate as the main pedagogic instrument, a syndicate being defined as a group set to carry out a specific task through co-operative effort. Each individual, working through and within his syndicate, must exercise responsibility.
12. The content of the course of studies should take as its focus the major issues which face the contemporary administrator, fitting them into a unified course structure. It is one of the achievements of the original conception of the Henley course that its main structure has proved itself as a stable foundation, having an inherent unity, while allowing for the flexibility that is necessary in adapting the issues to be studied to changing times and conditions. Within the basic framework, there is a division of subjects, each a demanding exercise in its own right, while yet making an appropriate contribution to the unity, coherence and build-up of the course of studies over the three months.
13. It is interesting to observe that somewhat similar thinking was at work in a different context, in the setting up of the Economic Development Institute of the World Bank, which offers an instructive analogy. In conception, it goes back to 1951. The first course was held in January 1956. Rather than grafting onto an established academic centre, a new institution was formed. The objective is to improve practice, to help senior officials to discharge better their present jobs, or jobs to which they might be promoted in the future. The only common denominator of all participants is their extensive experience. The first prerequisite for success, in the view of its Director, is the process which governs selection of participants. (3)
- (3) John H. Adler: Constituents of a General Programme in Economic Development: The Economic Development Institute of the World Bank, a paper given at the Second Annual Meeting of Directors of Training Institutes in the field of economic development, O.E.C.D. (Sept. 1962)

14. Seen in terms of the task and responsibility of the educationalist, certain important points emerge.

15. There is the relationship between staff and participants. They are jointly 'members' of a body corporate, colleagues in a joint task rather than tutors and students.

16. Henley is characterised by the primacy of syndicate work, supported by whatever other facilities or devices suit individual facets of the course, e.g. visiting speakers and advisers, outside visits, special documentation, specific instruction - as in the use and abuse of figures. Instruction is given where, in the College's view, the general level of understanding is inadequate. There is the attempt to stimulate the critical faculty in reading habits through systematic consideration of sources of current information, and the study of biographies, an apparent diversion in the early stages with a very positive bearing upon later subjects.

17. Method, content and participants cannot be considered apart. The course has its own intrinsic intellectual content, but many issues of group management are posed through the method of work, if only because tasks set are real tasks, individual responsibilities are real responsibilities.

18. The problem of keeping the emphasis on improved practice, while yet exploiting the contributions of the academic and the relevant developments taking place at the boundaries of knowledge, is difficult. Here the work of the Research Department is of particular importance. Along with its own research effort, it has the responsibility to maintain close contact with the academic world, to interpret new developments, and where there is a need to write papers which will help bring to practitioners of management an understanding of the new thinking arising from research. The closest of contact is necessary with the world of practice and particularly with nominating organisations.

HENLEY'S INTERNATIONAL CHARACTER

19. From the earliest days of the College, overseas interest in the College was substantial. Moreover, it was important that the course of studies should have an international dimension, not just by the special studies with an international theme which are part of its intellectual content, but by giving an international flavour to the whole of the work undertaken.

20. Ten per cent of available places are reserved for overseas candidates. These may come from any part of the world, from public service, central or local, from industry, commerce, finance and transport. There have by now been over two hundred from 37 different countries, all of whose education and practical experience have been outside the U.K. These figures do not include those of British origin working abroad. Because each session is divided into six syndicates, this means that each syndicate always includes one person from abroad.

21. The College has also been closely connected with overseas developments in management training. Many overseas visitors have spent substantial periods at the College studying its methods, and seeing something of the staff work which is so decisive in ensuring the effectiveness of the course.

22. By 1950 enquiries were being received from many parts of the world about the possibility of help being given to informal groups or official bodies overseas seeking to set up similar organisations. Partly because the resources of the College, both in men and money, were very limited, partly because it regarded its own methods as experimental, the College initially dealt cautiously with them, though it gave full facilities for accredited overseas visitors and provided written reports and suggestions.

23. In 1954 as a result of developments in Australia and in India, the College became much more actively involved. In both, the outcome was the setting up of an institution along Henley lines. More recently, as a result of interest shown by Pakistan, a College has been set up there with the financial help of the Ford Foundation and the joint collaboration of Syracuse University and Henley.

24. In addition the College has helped to formulate and implement schemes for advanced training in public and business administration in the West Indies, in Turkey and in Yugoslavia. Other projects are in the enquiry stage.

25. For the purpose of this conference, it would be fruitful to say a little more about India and Pakistan. A reminder is appropriate that by educational standards Henley itself is still quite young, while the Indian College started only five years ago and the Pakistan College is in its third year. These ventures must therefore be regarded as experiments, though undoubtedly not without useful lessons for others.

THE INDIA AND PAKISTAN COLLEGES

26. The Administrative Staff College of India opened in 1957. Fifteen sessions will have been held by the end of 1962. The opening session had thirty participants. This has now risen to nearer fifty. In composition, usually two-thirds come from the private sector, the others from central government, the state governments and nationalised industries.

27. The essential structure of the course of studies is very similar to that of Henley, but there are interesting differences. More explicit emphasis has been placed upon the importance of a close acquaintance with the social and political environment, and a deep understanding of the inter-relationship between different sectors of the national economy, especially an appreciation of how the respective roles of public administration and business management complement each other in achieving national objectives. Special studies are also made of selected industries, aspects of the five-year plan and the role in general of government in economic development.

28. In addition, tours are arranged to various organisations in different parts of the country. Some use is made of case studies and in this help has come from Harvard University, posing the interesting question of how best to link up case studies in a timely way with the main issues being considered.

29. The Pakistan College was established in 1960. There will have been five sessions by the end of 1962. At present there are twenty participants per session, soon to be increased to thirty. Two vacancies are reserved on each session for candidates whose education and practical experience have been outside Pakistan; this number will be increased to three from January 1963.. (Australia has a similar policy and has welcomed participants from South-East Asia, the Middle East, Pakistan and Nigeria.)

30. In composition the preponderance lies with the civil service. They may number seven in a syndicate of ten, with one from a public corporation, two from business and sometimes one from overseas. The main weight of support comes from the central government, the governments of West and East Pakistan and the public corporations.

31. The Ford Foundation helped financially in establishing the College, and Henley and Syracuse University jointly are assisting in the formative stage. The distinctive experience that each is able to bring, coupled with the over-riding criterion that the course of studies must reflect Pakistan's needs and conditions has led to the evolution of a course of studies, which particularly in its methodology has considerable originality.

32. The course is in two halves. In the first, a number of subjects are considered under the heading of General Administration, using primarily the syndicate method. Running parallel with this, is a seminar on the theory and practice of Development Administration and the Economics of Development, which also provides background material for individual work. Each participant, under the guidance of the College staff, has to prepare a seminar paper which is finally presented to the College as a whole. Subjects for individual study range over a wide field. The Constitution and the Basic Democracies form special studies also in this phase.

33. In the second half of the course, the subjects studied in syndicate are Programme Administration (social welfare, education, agriculture and industry) and the Role of the Administrator. Parallel with these are two major field exercises, one taking place in East, one in West Pakistan.

34. The Research Department of the Pakistan Staff College has been given a very ambitious role, in anticipation that the College will become a major centre for enquiry into problems of national development. A significant publishing programme has also been formulated.

35. The Pakistan College constitutes an instructive example of attuning ideas and approaches borrowed from the U.K. and the U.S.A. to the needs of a country with very different traditions and problems, a venture which is bound to be a rich source of experience in international collaboration.

CONCLUSIONS

36. From the nature of the Henley approach, in particular its dependence upon an adequate cross-section of different types of experience, it will be evident that a College along Henley lines will be most effective in its early stages where a country contains within itself a good range of experience. This is not to suggest that many of Henley's features, or the use of the syndicate as an educational instrument, cannot find useful application in the most diverse circumstances; but Henley stands for much more than that. Because of this, far from wishing to see 'Henleys' across the globe, the College has used its influence to advocate to those interested in establishing a Henley type of institution that they should examine most carefully and critically if such a College would be appropriate to their objectives and circumstances. Speaking generally, it is becoming less necessary now to stress the importance of a country's own educational traditions, stage of development, her size and diversity, as factors which should be uppermost in the minds of those seeking to transplant educational practice from one country to another, but there have been costly mistakes in the past in the field of management education through ignoring or unduly discounting such factors.
37. Having said this, what might be regarded as the essentials of a Henley type of course? It must be intensive, demanding and satisfying to participants. Primacy would understandably be given to syndicate work. Much therefore depends on securing the right kind of participant from a good cross-section of organisations. For this the College must command respect and confidence at the highest levels in government, business and educational circles. The College must be very close indeed to its nominators and to those in the academic world working in relevant disciplines. Environment and location are essential factors in securing the development of that corporate atmosphere wherein the exchange of experience can reach its most fruitful form.
38. Those concerned with establishing such an institution or programme must be prepared for the most intensive preliminary study and discussion. Any course of studies is demanding in this way, Henley more than most, because of the somewhat novel nature of its objectives and approach. The preparations necessary for each session are also very demanding.
39. A particularly acute problem in newly developing areas is how best to ensure a comparable level amongst participants. Much thought has to be given - at Henley and elsewhere - to this problem and to the efforts that might be necessary to ensure this for example through some form of pre-course preparation. This requires that the College should be experimental in its attitude, flexible in the design and timing of the programme and in exploiting various educational methods.
40. Staffing is not easy. The need, a combination of rich experience and academic depth, men who will be as much at ease in the world of the academic as in the world of practice whether in government or business, involves a rare and rather difficult balance.

41. There is the familiar dilemma between the sense of urgency of those grappling with the problems of development and the time that is so desirable if serious educational mistakes are to be avoided.
42. Given the establishment of a College, one would hope that it would provide some places on each session for participants from other countries. This is to the advantage of the College itself. It can also have an attraction in its own right to nominators, indigenous or not.
43. One also looks hopefully to the prospects of joint endeavours between colleges in different countries. There is the closest of collaboration between Henley and her sister institutions to mutual benefit, and there is ample scope for such collaboration not only in the formative stage, but in the field of comparative studies and research, once a College is established.
44. Henley is encouraged by the interest which its own efforts have aroused in other parts of the world and by the recognition demonstrated by this Conference of the critical role of the quality of administration in translating the advances of science and technology into the more tangible benefits of social and economic progress. Such problems are common to all countries, whatever their stage of development. Even in advanced countries the social, economic and administrative implications of applying science and technology have not been sufficiently recognised. Scientific and technological progress itself as well as application depend upon important decisions of policy which have to be taken by those in the highest positions of responsibility. This poses a critical educational task, in ensuring that those who take the decisions and those who are responsible for implementing them are sensitive to implications and have a command of the necessary skills which govern successful application. A very conscious awareness of this task lies at the heart of the Henley conception.



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19 Oct.1962

ORIGINAL : ENGLISH

UNITED NATIONS CONFERENCE
ON THE APPLICATION OF SCIENCE AND TECHNOLOGY
FOR THE BENEFIT OF THE LESS DEVELOPED AREAS

Agenda Item : B. 3

Yugoslavia

MANAGEMENT TECHNIQUES AND THEIR APPLICATION
IN LESS DEVELOPED AREAS : WORKERS' MANAGEMENT
IN YUGOSLAVIA

By Stjepan HAN,
Special Counsellor of the Secretariat of Labour,
Federal Executive Council of the Yugoslav Government

Papers have been contributed to the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas as working papers for that Conference. They are published as presented by the contributors, and the contents and the views expressed are those of the contributors. (See notes overleaf.)

NOTES

1. Papers selected for inclusion in General Sessions will be available at the Conference in the following official languages of the United Nations: English, French, Russian and Spanish.
2. Papers selected for inclusion in Specialized Sessions will be available at the Conference in only one of the above official languages.
3. Summaries of all papers, as submitted by contributors, will be available at the Conference in the following official languages of the United Nations: English, French, Russian and Spanish.
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MANAGEMENT TECHNIQUES AND THEIR APPLICATION IN LESS DEVELOPED AREAS

WORKERS' MANAGEMENT IN YUGOSLAVIA

By Stjepan HAN

Special Counsellor of the Secretariat of Labour, Federal Executive Council of the Yugoslav Government

1. The function of management in individual enterprises is becoming an increasingly important factor for the economic growth and social progress of nations. The degree of efficiency with which people apply their physical and intellectual abilities, and the purposefulness with which the land, minerals and other natural resources, then tools, machinery, buildings, transportation and other equipment are utilized - all this depends to an ever greater extent on the suitable choice of management techniques.

Considering that "The achievement of economic progress is everywhere dependent upon the combined influence of

- natural and human resources,
- scientific discoveries and inventions,
- engineering applications,
- business organization and management,
- the economic system,
- the government system"¹⁾

and taking into account that development policies can most easily and readily influence the fourth group of these factors, it is probably not an overstatement to declare that management techniques have a strong impact on the standard of living, the rate of its growth and the degree of contentment within communities, regardless of their specific characteristics and irrespective of the level of development already achieved.

2. It is clear, however, that the managers of economic enterprises in less-developed areas must take into account certain specific difficulties, the roots of which lie in the deficiency of adequately skilled workers, as well as in the social, institutional and political structure of such countries, which as a rule differ from the structure of relatively highly developed countries in which management techniques as known today were established and developed.

3. Finding ways and means of successfully overcoming these specific difficulties requires the clearest and fullest possible comprehension of the various degrees of development. It would not only be incorrect, but even dangerous, were we to neglect the differences between the conditions within individual less-developed countries when taking practical measures. This is not the place to go into detail about the appropriateness of the new theories describing stages of economic growth,²⁾ or about the justness of the sometimes rather severe criticisms of such theories.³⁾ We must take into account, however, that the

- 1) Moulton, H.G., Controlling Factors in Economic Development, The Brookings Institution, p. 358, Washington D.C. (1949).
- 2) Rostow, W.W., The Stages of Economic Growth, The University Press, Cambridge (1960)
- 3) Al'ter, L., O novejšei buržaznoj teoriji "ekonomičeskogo rosta", Voprosi ekonomiki, 6, 84-98 (1961).

differences in the levels of advancement of less-developed areas are at times quite considerable. In selecting a general method of management we must, therefore, apart from other things, be guided by the consequences of a given country's being precisely at a given particular stage and not any other in its socio-economic development.

4. In spite of these differences there are certain characteristics common to all the less-developed countries which are important for the selection of optimum management techniques. These common characteristics must be taken into account along with factors like the kind of activity performed by the enterprise and its size, which also influence the choice of management techniques. Perhaps it is not an oversimplification to define these common characteristics as (a) a relatively high percentage of farmers, the majority of whom are small land-owners; (b) a relatively fast process in the rural population's urbanization, the greater part of which population has no broader culture, lacks technical knowledge and is quite unaccustomed to work in the highly technical environment of modern urban industries, while they bring along outdated views and old social habits into their new surroundings; (c) a general lack of financial resources, and (d) above all, a more or less inadequate infrastructure.

5. It is consequently understandable why some efficiency experts think that less-developed countries cannot profit very much from the classic techniques of scientific management.⁴⁾ Even the extension of Taylorism to agriculture building construction works and other non-industrial activities, does not seem to many a matter of high priority, because of the abundance of labour - partly underemployed and partly unemployed - while money and real capital is scarce, so that the old antithesis: capital-intensive versus labour-intensive production processes, influences the choice of management techniques as well.

It appears, nevertheless, that managers in less-developed areas should not entirely give up this "good old" method of rationalization. It would only be wrong to exaggerate and consider it the most important management technique, as some time-and-motion study experts perhaps still do.

6. It was the physiological school of scientific management which, in combination with Fayol's theory of rational administration, played a dominant role in the development of science of organization during the First Quarter of the 20th Century. Workers were first of all considered as component parts of the organizational machinery, considering that their behaviour could be understood and controlled on the basis of a rather elementary knowledge about some physiological and psychological qualities of men,

In the Second Quarter of this Century, the human relations school of thought predominated - often in strong opposition to Taylorism-Fayolism. It regarded workers as beings with complex feelings who work well only when adequately motivated. Detailed studies of the causes and possibilities of preventing conflicts among workers, as well as on group cohesion and group dynamics, were taken up during this period.

The most recent contributions in this field regard the worker primarily as an intelligent being capable of solving various problems and consequently reaching corresponding decisions at all levels of the organizational hierarchy.⁵⁾

7. During the last decade, a new theory has been developing which, while constituting a synthesis of the essential teachings of the three above mentioned schools of thought, bases the organization of economic enterprises primarily on the mechanism of decision making. According to this theory, the most important function of management is the optimum distribution of authority for the bringing of specific decisions. With the help of operations research and other mathematical methods, and with the growing possibilities for the use of

4) "Our aim is to develop underdeveloped countries. To do so by concentrating efforts upon an increase of labour productivity by means of industrial engineering (vintage Taylor, Gilbreth, et al.) is ineffective due to the limited influence of the industrial sector upon gross national produce." Chapiro, J., Operations Research Experience in an Underdeveloped Economy, Management Sciences. Proceedings of the VI. International Meeting of the Institute of Management Sciences. Vol. I., p. 112. Pergamon Press, London (1960)

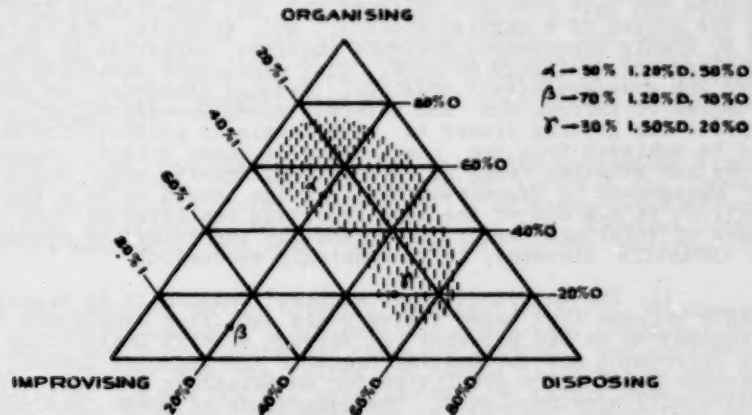
5) March, J.C. & Simon, H.A., Organizations, John Wiley and Sons, Inc., New York (1958).

electronic computers, entirely new procedures are about to change the intuitive art of management into an objective science of organization. These modern techniques are, as a matter of fact, already being applied in some of the less-developed countries.

The numerous decisions taken in enterprises are neither identical in the way they are brought, nor in respect to subject. For instance, a decision of an economic enterprise, relative to its scope, duration and general nature, may be:

- an "improvization"
- a "disposition" (to be understood as an operational decision) or
- "organization" (to be understood as the conscious act of organizing.)⁶⁾

It is true that the border between these three kinds of decisions is always flexible and sometimes changing. It is also true that in practice there are never distinct types of decision, but, as a rule, such types that have all the characteristics in varying combinations, as, for instance, in Fig. 1. for types of decisions α , β and γ . It does not inevitably follow from this, however, that we could, without doing harm, underestimate the value of systematic analyses, or believe that the management of enterprises can be properly organized without them.



8. The results of such analyses, which, it is understood, take into consideration many other characteristics too, raise the question of who brings the decisions. The modern theory of organization is reviving the old problem of centralization versus decentralization, that has been tackled with some success, although from an entirely different aspect, by the psychological school of organizers, and has gained renewed momentum in the world-wide productivity movement of today. Decentralization of managerial authority is being proposed by many and practised for extremely diverse reasons. If, particularly from the standpoint of the less-developed countries, it is true that "...a productivity drive requires wholesome cooperation and understanding from workers" and that "The social disruption, lack of social skills, and consequent lack of adequate communications between the individuals and their environment create exactly the opposite social temperature to that required"⁷⁾ then the only solution is in decentralizing as much as possible. From the point of view of the promotion of the efficiency of a big firm, Mr. R.J. Cordiner, President of General Electric, formulated ten principles for decentralization, the first being: "Decentralization places authority to make decisions at points as near as possible to where actions take place"⁸⁾. The decentralization of the management of the economy which

6) Henning, K. W., Betriebswirtschaftliche Organisationslehre, Springer-Verlag, pp.16-17, Berlin (1948).

7) Chapiro, J., loc.cit.

8) Cordiner, R. J., New Frontiers for Professional Managers, McGraw Hill Book Company, Inc., pp.50-52, New York (1956).

was begun in the Soviet Union several years ago - although at different levels and to varying extents - will necessarily bring about decentralization in enterprises also, in their establishments and work-shops. It appears then that highly centralized management techniques, be they autocratic or bureaucratic, are rapidly losing ground.

9. The practice of decentralizing managerial authority in Yugoslavia is about twelve years old, but some of its roots are much older. The ideas of socialist thinkers and the programmes of progressive labour movements of the 19th and 20th Century, have gradually strengthened the struggle for industrial democracy. While passing through certain theoretical discordances and a series of compromises which political practice was forced into, this struggle resulted in the creation of joint consultation, co-determination, works councils, and the like. However, whereas "... the functions of Works Councils are informative and consultative" ⁹⁾ workers in Yugoslavia are really the managers of the enterprises in which they work.

10. This paper will now describe the Yugoslav system of workers' management, although it is realized that this could not be done adequately even if the space and time allowed were much greater.

This system was conceived in Yugoslavia from the merging of two widely different currents of ideas: the old socialist aspiration for the emancipation of labour, organized without external coercion, by voluntary associations of producers who have overcome "alienation" and superfluous frustration, thus forming the nuclei of a happier society; and, secondly, the strictly pragmatic demand of highly experienced business managers, supported by the latest results of psychology and sociology of work, that managerial authority must be decentralized to the greatest extent possible, because otherwise we should never attain the degree of information and interest among workers which is a necessary prerequisite for getting closer to such levels of productivity which theoretically could be achieved from the combination of human talent, disposable natural resources and existing means of production. Drawing upon these two sources, workers' management in Yugoslavia has long ago ceased to be a timid scholarly experiment. It is now one of the most important realities of life which, through the process of trial and error, is gradually improving its mechanism, and despite some infantile diseases, is increasingly successful.

11. The introduction of workers' management in Yugoslav enterprises is a steady process that began twelve years ago. Five stages are discernable in its development up to the present: (a) Through a Joint Instruction issued by the Federal Government and the Central Board of the Yugoslav Trades' Union Federation, in December 1949, the modalities for establishing Workers' Councils with limited authority were regulated. The competence of these new bodies of management were limited to the examination of proposals, the expression of opinions and the proposal of measures to be taken. (b) Six months later, June 28, 1950, the Basic Law on the Management of Economic Enterprises by Working Collectives was passed. This document clearly stated that the working collectives manage the economic enterprises, which are the property of the Yugoslav society as a whole, that they execute their managerial rights through the Workers' Councils and Management Boards, and that the director of the enterprise conducts the regular business operations. (c) The third stage began two and a half years later when the Constitutional Law, promulgated in 1953, stipulated that the working collectives manage directly and through the Workers' Council. (d) The fourth stage was the further implementation of the principle of bringing each member of the collective closer to the practical performance of management functions. The most important feature of this process was the beginning of the formation of "economic units", namely smaller self-governing component production units or other departments, within each enterprise. These "economic" units, as the organizational and also sociological elements of the enterprise, are smaller production and management entities whose activities are more homogeneous than those of the entire enterprise, thereby facilitating a more profound understanding of its problems, which is essential for efficient management. (e) A new stage will begin with the implementation of the new Constitution whose draft foresees, in a number of paragraphs, that one of the basic rights of the workers is the management of economic and other organizations to which they belong.

12. Workers' management, of course, is no substitute for the other management techniques that are applied today. Rather, it is their complement, and

9) Vallstrand., L., Works Councils in Sweden. European Productivity Agency, p.6, Paris.

the necessary pre-condition for their efficient application within a society like that in Yugoslavia. The organization of good communications within the enterprise, recruitment, selection and training of workers and managers, management of production facilities and cost accounting, the establishment of good relations between industry and government¹⁰⁾ and many other tasks, are the daily concern of the Workers' Councils, Management Boards and directors in the country. The long-term, far-reaching and more general tasks, whose performance requires organizational measures, fall within the competence of the whole collective and the central Workers' Council, while the Management Board, as a rule, deals with a whole series of operational business "dispositions" implementing them through the director who, in carrying out the general policy of the Workers' Council within the limits of his authority, frequently brings decisions that are, in character, closer to the pole of "improvisation" in Fig. I. We repeat, however, that this is not strictly the rule, for there may be occasions when the central Workers' Council must improvise, and vice versa. It is important that in such a structure of management, the attitude towards work, towards the interests of the enterprise as a whole, towards the director and towards the technical experts is undergoing radical change. In view of the fact that the personal earnings of the Yugoslav worker are being formed on the basis of his work performance and the achievements of the "economic unit", as well as of the whole enterprise in which he works, all the members of the collective are vitally interested in getting the best instruction and having the best organization of production process from their director and/or technical, economic, commercial, financial and other experts of the enterprise. The directors are no longer despised "slave drivers" but are useful and respected counsellors and leaders, who, in the improved atmosphere, relieved of the worries of maintaining discipline, now carry on those highly skilled functions for which they alone have the necessary qualifications. It need not be understood that this has already been achieved in all Yugoslav enterprises, but it can without exaggeration be said that things are developing much faster than was expected.

13. Figure II. is self-explanatory and shows the management structure of a larger Yugoslav enterprise in the metal industry in which the "economic units" have their own management bodies, and quite a differentiated system of specialized technical commissions. Besides members of the Workers' Councils, experts, who are not members at the time, may also sit at the meetings of the commissions.

14. The competencies of the central Workers' Councils encompass all the prerogatives of top management: long-term and short-term planning, the determining of general production, sales and financial policy, the conducting of personnel affairs including also the policy of income distribution, and so on. The Workers' Councils of larger and big enterprises have lately been transferring an ever growing part of their competencies to the staff assemblies and the Workers' Councils of the "economic units", in the first place for the sake of achieving that "... wholesome cooperation and understanding..." which is one of the pre-conditions for the successful application of all other management techniques.

15. An enquiry conducted by the Secretariat of Labour of the Federal Executive Council in March 1962 (which took in 13,299 or about 70 percent of the 19,000 or so enterprises and other organizations that were in existence at that time), revealed that 7,338, or about 56 percent of the enterprises canvassed had based their organization on "economic units". Table 1 shows the varying intensity with which different rights of decision had been effected on the part of the "economic units" in various fields of economic activity. The percentages are high, but when drawing a conclusion it should be borne in mind that this development is just at its beginning and, though the figures in themselves are correct, they do not always mirror the fact that the newly created "economic units" cannot yet possess the full measure of management skill and experience.

16. To evaluate the intensity of the influence of workers' management, quantitative factors must also be taken into consideration and not just qualitative ones. TABLE 2 shows the number of workers that had participated in workers' management bodies in the course of 1960. If it is taken into account that there were about 2,400,000 people employed in the socialized sector of the economy that year, and that about 30 percent of the members were re-elected for a second term of office at the annual and less frequent bi-annual elections; then it is

10) Management of Industrial Enterprises in Under-developed Countries, United Nations publication, 58.II.B.5., New York (1958).

not difficult to perceive that a large majority of all the employed will have been active in bodies of workers' management in the course of some fifteen years especially if membership in the Workers' Councils of the "economic units", which the table does not take into consideration, were also to be taken into account.

17. In the present stage of the economic, social and political development of Yugoslavia, the workers' management system is a good solution. Although it is difficult to accept without further qualifications the assertion of a distinguished ILO expert, MR. R. C. Wynne-Roberts, that "... the Yugoslav system of management of enterprises through an elected committee drawn from all classes of workers (and in larger enterprises, subsidiary shop-committees) seems to offer the newly arrived peasant the type of consultative mechanism with elective rights not essentially different from the social organization to which he is accustomed in his own village,"¹¹) it is nevertheless correct that for some less-developed countries workers' management could be interesting from that point of view too. The aim of keeping the price of industrialization and development of less-developed countries in general as low as possible, is quite justified. Consequently, when choosing a general pattern of management, there is no need to believe, a priori, that the difficult path of the classical industrial revolution is the only solution. There are ways for creating proper development policies by benefiting from the experiences of others, and choosing management techniques which would minimize the losses in happiness and human dignity. That is definitely something worth fighting for.

RIGHTS OF ECONOMIC UNITS

	ECONOMIC ACTIVITY	Number of enterprises having economic units	Economic units decide in matters of			
			labor relations		income distribution	
			number	%	number	%
a	b	1	2	3	4	5
1	Commerce	1 992	759	38	381	19
2	Public Utilities	202	78	39	49	24
3	Small-scale Industry, Crafts and Services	984	435	44	196	20
4	<u>ALL ACTIVITIES</u>	<u>7 338</u>	<u>3 658</u>	<u>50</u>	<u>2 361</u>	<u>32</u>
5	Agriculture	1 568	808	52	575	37
6	Construction	380	197	52	118	31
7	Transport	299	159	63	117	39
8	Manufacturing and Mining	1 833	1 167	64	879	48
9	Forestry	80	55	69	46	58

TABLE 1.

¹¹) Management of Industrial Enterprises in Under-developed Countries, loc. cit. and Industrialization and Productivity, 2, 44-45, United Nations, New York (1959)

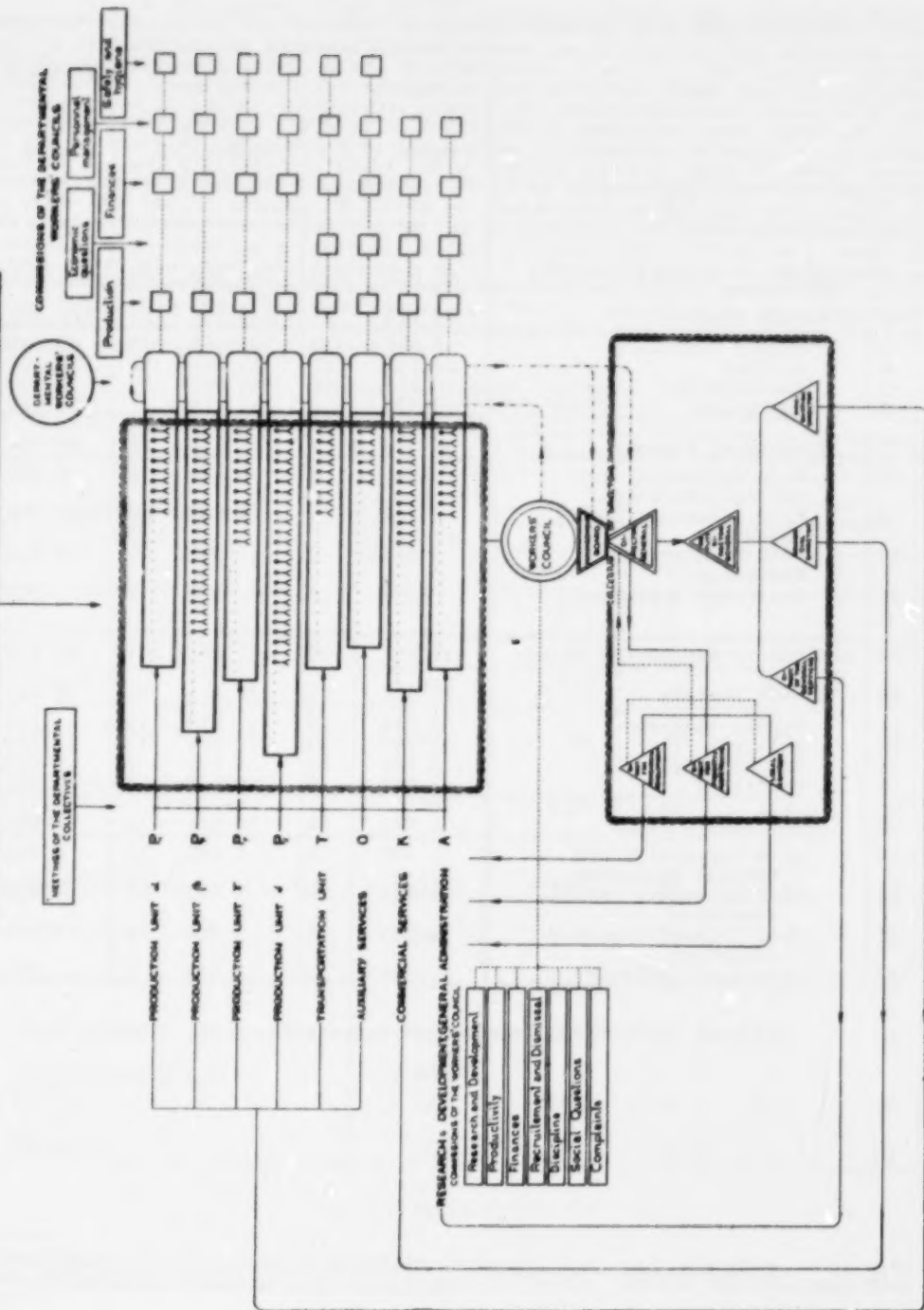
NUMBER AND COMPOSITION OF
WORKERS COUNCILS AND MANAGEMENT BOARDS
(1960)

		In enterprises with 7 to 29 workers		In enterprises with 30 workers and more		In all enterprises	
		number	%	number	%	number	%
a	b	1	2	3	4	5	6
1	MEMBERS OF WORKERS COUNCILS	60 871	100	156 300	100	217 171	100
2	Manual Workers	49 272	81	119 157	76	168 429	78
3	Highly Skilled	6 009	10	23 649	15	29 658	14
4	Skilled	24 752	41	63 348	41	88 100	41
5	Semiskilled	10 115	16	20 885	13	31 000	14
6	Unskilled	8 396	14	11 275	7	19 671	9
7	Non-manual Workers	11 599	19	37 143	24	48 742	22
8	With University and College Education	1 644	3	6 480	4	8 124	3
9	With Secondary School Education	5 132	8	18 742	12	23 874	11
10	With Primary School Education	3 647	6	11 002	7	14 849	7
11	Auxiliary Employees	976	2	919	1	1 895	1
12	MEMBERS OF MANAGEMENT BOARDS	17 191	100	51 261	100	68 452	100
13	Manual Workers	13 118	76	34 445	67	47 563	70
14	Highly Skilled	3 256	19	9 893	19	13 149	19
15	Skilled	6 750	39	17 844	35	24 594	36
16	Semiskilled	2 144	12	4 551	9	6 695	10
17	Unskilled	968	6	2 157	4	3 125	5
18	Non-manual Workers	4 073	24	16 816	33	20 889	30
19	With University and College Education	1 209	7	5 658	11	6 867	10
20	With Secondary School Education	1 734	10	7 702	15	9 439	13
21	With Primary School Education	1 043	6	3 264	6	4 327	6
22	Auxiliary Employees	84	1	172	1	256	1

Source: Statistical Yearbook of Yugoslavia, p.29, (1962)

TABLE 2

ASSEMBLY OF THE WORKING COLLECTIVE



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19 Oct.1962

ORIGINAL : FRANCAIS

**CONFÉRENCE DES NATIONS UNIES
SUR L'APPLICATION DE LA SCIENCE ET DE LA TECHNIQUE
DANS L'INTÉRÊT DES RÉGIONS PEU DÉVELOPPÉES**

Point de l'ordre du jour : B.2.2

France

**LA FORMATION PROFESSIONNELLE
DANS LES PAYS EN VOIE D'EXPANSION ECONOMIQUE RAPIDE**

Par M. Raymond LAMBERT,
Ingénieur des Arts et Métiers
et de l'Ecole Supérieure d'Electricité de Paris,
Contrôleur général de l'Electricité de France

Les mémoires rédigés à l'intention de la Conférence des Nations Unies sur l'application de la science et de la technique dans l'intérêt des régions peu développées sont des documents de travail. Ils sont publiés tels qu'ils ont été présentés et les assertions et opinions qu'ils contiennent sont celles de leurs auteurs.

NOTES

1. Les mémoires choisis pour être présentés en séance générale pourront être obtenus à la Conférence dans les langues officielles suivantes des Nations Unies: anglais, espagnol, français et russe.
2. Les mémoires choisis pour être présentés en séance spéciale pourront être obtenus à la Conférence dans l'une seulement de ces langues officielles.
3. Les résumés qui ont été rédigés pour tous les mémoires par les auteurs de ceux-ci pourront être obtenus à la Conférence dans les langues officielles suivantes des Nations Unies: anglais, espagnol, français et russe.
4. Préalablement à la Conférence, les mémoires et les résumés ne feront pas l'objet d'une distribution générale mais d'un tirage restreint destiné aux délégations des gouvernements et autres participants officiels. La publication et la distribution générale des actes de la Conférence s'effectueront conformément aux règles et pratiques agréées par le Comité des publications des Nations Unies.

LA FORMATION PROFESSIONNELLE
DANS LES PAYS EN VOIE D'EXPANSION ECONOMIQUE RAPIDE

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1. - CONSIDERATIONS GENERALES SUR LA FORMATION PROFESSIONNELLE DANS LES
PAYS EN VOIE DE DEVELOPPEMENT RAPIDE

a) LE CHAMP D'ACTION DE LA FORMATION PROFESSIONNELLE

Pour éviter toute ambiguïté dans l'interprétation de notre rapport, nous croyons utile de préciser ici le sens que nous donnons à la "Formation Professionnelle" (F.P.). En effet, il nous a été donné de constater que celle-ci était parfois mal définie par rapport à ce que l'on dénomme traditionnellement "Enseignement", alors que ces deux domaines, d'ailleurs complémentaires, ont chacun leurs propres caractéristiques qu'il convient de bien distinguer. A notre avis, entrent dans le cadre de la F.P. les actions dont l'objectif est la formation ou le perfectionnement professionnel de personnes salariées de tous niveaux hiérarchiques et de toutes spécialités. L'adaptation aux postes de travail, le perfectionnement dans les Entreprises en vue de la promotion interne, l'alphabétisation ouvrière, en particulier, sont du ressort de la F.P., laquelle utilise généralement des programmes basés sur des cycles d'instruction courts. Ceci dit, nous précisons qu'il ne sera pas traité, dans ce mémoire, des problèmes qui concernent l'Enseignement proprement dit. Cela ne signifie pas, pour autant, que nous en négligions l'importance, notamment pour ce qui a trait à la coordination indispensable des activités de formation développées dans chacun des deux secteurs (voir 2-b).

b) LES OBJECTIFS ET L'ORGANISATION DE LA FORMATION PROFESSIONNELLE

De l'avis général, la F.P. constitue dans les pays considérés un facteur particulièrement important du progrès économique et social. Elle doit donc s'y développer avec ampleur, dynamisme et efficacité, car, est-il besoin de le rappeler, la base essentielle de l'expansion d'un pays réside dans l'utilisation maximum de ses ressources naturelles inemployées, et plus spécialement de ses ressources humaines.

Les nombreuses constatations qu'il nous a été possible de faire depuis cinq années dans des pays d'Afrique, d'Amérique latine, du Proche-Orient

et d'Extrême-Orient, nous conduisent à formuler les opinions et recommandations suivantes en matière de F.P. :

i) Ampleur de la F.P. - Il est notoire que tous les pays en expansion rapide ont un besoin urgent d'ouvriers, de cadres de maîtrise, de techniciens, aussi bien que d'ingénieurs de réalisation. En outre, on constate généralement que, faute de main d'oeuvre qualifiée au niveau exécution et aux échelons intermédiaires, les cadres de ces pays, notamment les ingénieurs, sont contraints d'assurer des tâches qui ne sont pas de leur ressort et pour lesquelles ils n'ont pas été formés. Ceci est particulièrement déplorable si l'on considère, d'une part que le nombre des cadres est, par lui-même notoirement insuffisant, d'autre part que les jeunes ingénieurs issus de l'Enseignement Supérieur sont souvent peu préparés, techniquement et psychologiquement, à affronter les problèmes de production qui demeurent fondamentaux dans les pays en expansion rapide. Nous estimons, en conséquence, que lorsqu'on décide d'engager une action de F.P. dans un secteur déterminé, il convient d'y englober toutes les couches hiérarchiques, sans exception, du manoeuvre à l'ingénieur. Nous pouvons donner des exemples de telles actions organisées en Amérique latine en liaison avec des Universités ou des Organismes officiels jouant un rôle national en matière d'enseignement (voir 2-b).

La rapidité et l'étendue des actions de F.P. développées dans un secteur donné constituent, par ailleurs, des facteurs déterminants de leur réussite. Il est donc nécessaire de prévoir des cycles d'une durée aussi réduite que possible et qui soient susceptibles de toucher un nombre important de personnes sans que la qualité de l'enseignement doive en souffrir. La mise en oeuvre d'un tel programme est évidemment conditionnée, dans sa phase initiale, par la formation de formateurs qui assurent ensuite la multiplication des actions en instruisant, à leur tour, des moniteurs.

Nous pensons également que dans une famille professionnelle déterminée, la formation et le perfectionnement doivent être diffusés verticalement à partir des couches inférieures de la hiérarchie. C'est au travers de ces actions que s'opère la sélection progressive des éléments les plus doués et les plus méritants et que se trouve assurée rapidement la promotion de la main d'oeuvre nationale.

Enfin, on doit s'efforcer dans chaque Entreprise d'assurer en priorité le perfectionnement des adultes déjà engagés par rapport à la formation des nouveaux embauchés.

ii) Alphabétisation ouvrière - A la base de la pyramide hiérarchique il est parfois nécessaire d'organiser une "alphabétisation ouvrière" très largement ouverte aux manoeuvres et aux ouvriers n'ayant reçu qu'une instruction de base rudimentaire ou même analphabètes. Une synchronisation méthodique de l'alphabétisation littéraire et de l'apprentissage d'un métier est alors vivement conseillée. Nous avons pu constater les résultats bienfaisants de l'application d'une telle méthode, sur les plans professionnel et social, à des travailleurs pourvus d'excellentes aptitudes qui avaient coutume d'évoluer journellement dans l'ignorance et dans la routine.

iii) Formation d'ouvriers qualifiés - A ce niveau, nous préconisons la définition, par famille professionnelle, d'une "plate-forme de base de formation" très polyvalente. Ce n'est qu'après l'acquisition de ces connais-

sances que l'enseignement spécialisé est dispensé en fonction des aptitudes particulières constatées.

iv) Formation de l'encadrement moyen - Nous avons déjà évoqué l'erreur qui consiste à former des cadres, si qualifiés soient-ils, des ingénieurs en particulier, sans en même temps mettre en place les spécialistes appelés à prolonger leur action. Il est primordial, en particulier, de former également l'encadrement de contact dont les pays en expansion ont un si grand besoin : chefs d'équipes, contremaîtres d'usines et de chantiers, petits cadres administratifs et commerciaux etc ... Dans ce domaine, on doit se préoccuper avec la même intensité de la formation technique et de la formation caractéristique et avoir à l'esprit que les changements de structures se réalisent par les hommes et que, par conséquent, ceux-ci doivent être en mesure de les promouvoir et de s'y adapter. Il s'ensuit que la formation aux problèmes de gestion, d'organisation, de relations de travail et de commandement ne peut en aucun cas être négligée.

Enfin, une place importante est à prévoir pour la formation des techniciens moyens et des assistants d'ingénieurs dont le rôle, en matière d'études et de recherches notamment, nous semble fondamental.

v) Perfectionnement technologique des cadres techniques - On note souvent, dans les pays peu développés, l'existence d'une élite de gens instruits dans les disciplines littéraires et juridiques, alors que les cadres techniques font presque totalement défaut. Généralement, les scientifiques sont d'ailleurs plutôt des universitaires que des ingénieurs industriels et s'intéressent assez peu aux problèmes de production. Depuis quelques années, nous avons heureusement constaté l'amorçage, dans certains pays, d'un fort courant en faveur d'une formation technologique plus poussée des futurs cadres de l'économie. Nous croyons qu'il est convenable d'encourager cette tendance et nous pensons que les jeunes ingénieurs issus de l'Enseignement Supérieur tireraient grand profit de cours de technologie spécialisée, et même de séances de travaux pratiques, qui seraient organisés à leur intention dans le cadre de la F.P. Leurs possibilités d'accéder rapidement à des postes de responsabilité s'en trouveraient, sans aucun doute, très sérieusement accrues.

Sur un plan plus général, nous estimons qu'il convient également de favoriser la réalisation de projets conçus dans certains pays tendant à grouper, dans une même Université technique, des enseignements visant tous les niveaux de la hiérarchie, de l'ouvrier à l'ingénieur. Cette formule présente par ailleurs l'avantage d'être très économique, en ce qui concerne notamment l'utilisation des équipements pédagogiques.

c) LES PROBLEMES QUE POSE GENERALEMENT LA FORMATION PROFESSIONNELLE SUR LES PLANS PEDAGOGIQUE ET PSYCHOLOGIQUE

Nous avons déjà dit que la F.P., dans les pays en expansion rapide, devait être dynamique, efficace, massive et de qualité. A ces facteurs, nous en ajouterons un autre qui n'est pas moins important : l'humanisme qui doit imprégner toute action de F.P., qu'il s'agisse en particulier de l'alphabétisation ouvrière ou de la promotion interne des travailleurs au sein des Entreprises. Mais comment atteindre les objectifs fixés avec le maximum de rendement et de sécurité, dans un monde où les techniques matérielles évoluent sans cesse ? Selon nous, le problème fondamental qui se pose est celui des programmes et sur-

tout des méthodes et des moyens pédagogiques à appliquer : de la nature et de la qualité des solutions choisies dépend le succès ou l'échec de l'action engagée.

i) Méthodes et programmes - Il est nécessaire de découvrir et de mettre en oeuvre, dans le minimum de temps, des techniques pédagogiques susceptibles d'adapter le maximum de connaissances à toutes les formes d'intelligences, de sensibilités et de caractères. La promotion des adultes, par exemple, exige la mise en pratique de moyens et de processus nouveaux adaptés, dans chaque pays, au type humain existant. Nous pensons qu'il convient, dans ce domaine, de rejeter les systèmes et les méthodes d'enseignement utilisés dans les pays fortement industrialisés qui s'appliquent généralement à des personnes ayant déjà bénéficié d'un acquis de culture générale important (8 à 10 années de scolarisation) et qui sont pourvues d'un pouvoir d'adaptation relativement élevé résultant d'une certaine "imprégnation industrielle". En matière de programmes, nous sommes persuadé que l'évolution rapide des techniques et des méthodes de travail conduit à orienter la F.P. vers des types de formation polyvalents faisant une large place à un "enseignement de compréhension" plutôt qu'à l'acquisition systématique de quelques techniques qui seront ensuite appliquées dans la routine.

ii) Alphabétisation des adultes - L'alphabétisation ouvrière des adultes, dans les pays peu développés, constitue la condition sine qua non de la promotion interne des travailleurs de base qui sont le plus souvent illettrés. Mais il nous semble que jusqu'à présent on se soit principalement intéressé à une alphabétisation en surface, de caractère littéraire, comportant surtout des objectifs sociaux, d'ailleurs parfaitement louables. S'agissant essentiellement d'adultes, préoccupés avant tout de sortir de la condition matérielle difficile dans laquelle ils se trouvent, nous croyons qu'une telle alphabétisation n'a vraiment de chance de réussir que si elle se développe dans le cadre d'une famille professionnelle donnée et débouche immédiatement sur l'acquisition et la pratique d'un métier. La mise en oeuvre d'une pareille méthode, que nous avons d'ailleurs préconisée pour la première fois à un Séminaire organisé en 1959, à Essaouira, par le Gouvernement Marocain, nécessite l'emploi d'un matériel audio-visuel important, qu'il convient d'étudier spécialement, par famille professionnelle (voir 2-b).

iii) Formation physique professionnelle - Nous avons souvent observé que les travailleurs manuels des pays peu développés étaient très vulnérables à la fatigue physique. Sans chercher à analyser les causes de cet état de choses (climat, sous-alimentation, hygiène, etc ...) mais en nous référant à la connaissance que nous avons personnellement de ce problème, nous pensons qu'une place importante devrait être réservée, dans la F.P., à ce que nous avons appelé la "formation physique professionnelle". Cette forme d'éducation consiste, pour des spécialités professionnelles essentiellement actives, à entraîner spécialement les travailleurs, notamment les jeunes, à l'exercice des gestes fondamentaux de leur métier. La mise en oeuvre de cette formation, qui se développe parallèlement à la formation technique, est fort intéressante puisqu'elle conduit à une augmentation du degré de sécurité et du rendement des travailleurs tout en diminuant leur fatigue. Elle permet aussi une réduction importante du temps total consacré à l'enseignement des gestes physico-techniques et améliore le rendement qualitatif de l'enseignement du fait d'une plus grande réceptivité intellectuelle des intéressés.

D'intéressantes études et expériences ont été réalisées, à ce sujet, à l'Ecole Nationale de Métiers d'Electricité de France de Gurcy-le-Châtel pour la profession d'"électricien de réseaux aériens".

iv) Formation caractérielle - Nous avons déjà souligné l'importance qu'il convient de donner au facteur humain dans le développement d'une action de F.P. Aussi, la préparation aux changements de structures et surtout à l'exercice des responsabilités, notamment aux niveaux "exécution" et "encadrement moyen", doit-elle être intégrée en permanence aux programmes de F.P. Nous référant à nouveau aux importants résultats que nous avons obtenus dans les Ecoles d'Electricité de France de Gurcy et de Soissons par l'application de systèmes basés sur l'auto-discipline et l'auto-gestion qui ont maintenant largement fait leurs preuves, nous préconisons qu'une éducation analogue soit développée dans le cadre de la F.P. chaque fois que les circonstances le permettent, en commençant par les jeunes apprentis et les jeunes adultes. C'est, selon nous, le plus sûr moyen de préparer les hommes conscients et responsables dont l'économie des pays considérés a le plus grand besoin.

2. - LA FORMATION PROFESSIONNELLE DANS LE DEVELOPPEMENT DES PROGRAMMES D'EQUIPEMENT ET D'EXPLOITATION DES OUVRAGES DE PRODUCTION, DE TRANSPORT ET DE DISTRIBUTION D'ENERGIE ELECTRIQUE

a) OBJECTIFS

La demande d'énergie électrique se développe à une telle allure dans la plupart des pays considérés qu'elle détermine, au sein des Entreprises et Services publics d'électricité, des besoins importants et variés en personnel qualifié de tous niveaux. Parallèlement, l'utilisation industrielle, domestique et même artisanale de l'électricité, nécessite la mise en jeu d'activités spécialisées et très différenciées exigeant la formation rapide d'une main d'oeuvre de qualité. Pour ces raisons, nous considérons qu'il est fondamental, dans les pays en expansion, d'apporter le plus grand soin au développement méthodique d'un programme de F.P. portant sur les disciplines et les spécialisations qui intéressent l'électricité, l'électro-mécanique, et, le cas échéant, l'électronique industrielle.

En ce qui concerne plus spécialement la production, le transport et la distribution de l'électricité, nous avons constaté que les Entreprises et Etablissements concessionnaires ou gérants de Services publics d'électricité étaient amenés de plus en plus à assumer eux-mêmes la formation et le perfectionnement d'une grande partie de leur personnel technique. Ceci résulte, d'une part de ce que les spécialistes dont ils ont besoin n'existent pratiquement pas sur le marché du travail, d'autre part de ce que la promotion interne des meilleurs éléments du personnel d'exécution se révèle souvent comme étant la solution la plus rentable et la plus équitable pour assurer le recrutement, toujours délicat, du personnel des niveaux intermédiaires. Les actions à développer dans ce secteur viseront donc, en même temps, un double but : amélioration maximum de la qualification du personnel à tous les échelons et sélection des meilleurs agents en vue de leur promotion à des postes de niveau supérieur.

Nous pensons, par ailleurs, que les programmes à mettre en oeuvre doivent être orientés vers les principaux objectifs suivants : Formation et perfectionnement des ouvriers, chefs d'équipes et contremaîtres nécessaires à l'exploitation et à l'entretien des centrales électriques (hydrauliques, thermiques-vapeur, thermiques-diesel), des réseaux de distribution et des lignes de transport - Formation et perfectionnement de techniciens moyens : assistants d'ingénieurs, auxiliaires techniques, agents de contrôle, surveillants de travaux, etc ... - Formation spécialisée et perfectionnement des employés et des cadres moyens administratifs, comptables et commerciaux - Perfectionnement technologique spécialisé des jeunes ingénieurs.

b) CARACTERISTIQUES GENERALES DES CENTRES CREEES AVEC LE CONCOURS DE LA FRANCE (COOPERATION TECHNIQUE ET ELECTRICITE DE FRANCE) DANS DES PAYS D'AFRIQUE ET D'AMERIQUE LATINE

1) Organisation - A la demande de certains pays d'Afrique et d'Amérique latine, les Services de Coopération Technique du Gouvernement français développent depuis 1957, en accord avec l'Electricité de France, un programme de coopération axé sur la F.P. dans les branches de l'électricité et de l'électro-mécanique. Parallèlement, l'E.D.F. accentue l'aide technique qu'elle apporte aux Sociétés d'Economie mixte situées en Territoire étranger en l'étendant massivement à la formation de leur personnel autochtone. Toutes ces actions s'appuient sur les réalisations les plus typiques de l'Ecole Nationale de Métiers de Gurcy-le-Châtel, et plus spécialement sur les méthodes pédagogiques originales mises au point et appliquées avec succès par cet Etablissement pour la formation des jeunes ouvriers et techniciens, le perfectionnement ou la conversion des adultes et dans la promotion ouvrière.

Le fonctionnement des Etablissements ainsi créés est défini par les Pays intéressés eux-mêmes, en fonction des objectifs visés. Certains Etablissements, les plus nombreux, ont essentiellement le caractère de "Centres de documentation pédagogique" et sont destinés, d'une part à faire connaître et à diffuser les méthodes et moyens pédagogiques préconisés pour la F.P. du personnel des Industries électriques, d'autre part à former les futurs formateurs des Entreprises et étudier leurs plans de formation et les moyens correspondants à mettre en oeuvre. D'autres Etablissements, tout en jouant le rôle qui vient d'être défini, assurent directement le perfectionnement d'ouvriers qualifiés et la formation de cadres de maîtrise. Ce sont de véritables "Centres de formation et de perfectionnement".

Les modalités d'organisation de ces Centres font l'objet de Conventions passées avec les Autorités locales qui en formulent le désir. Participent généralement à ces Accords : d'une part, une ou plusieurs Entreprises publiques, privées ou para-publiques de production et de distribution d'électricité pour ce qui est relatif à la formation spécialisée; d'autre part, un Organisme officiel chargé sur un plan national des problèmes de F.P. pour ce qui concerne l'enseignement de base. Dans certains cas, des Facultés ou des Ecoles d'Ingénieurs collaborent également au fonctionnement des Centres en vue de l'utilisation de certains de leurs moyens pédagogiques et surtout pour la formation technologique et pratique de leurs étudiants.

Le processus généralement suivi pour le lancement des actions évoquées comporte essentiellement : la formation pédagogique à l'Ecole E.D.F. de Gurcy-le-Châtel des ingénieurs et techniciens désignés par les pays intéres-

sés en vue de leur donner un rôle dans le domaine de la F.P. - l'étude en commun, dans cette Ecole, des programmes et des méthodes qui seront appliqués - la mise au point et la construction du matériel d'enseignement (aides audio-visuelles, en particulier) constituant l'équipement de base des Centres, ainsi que la préparation et la traduction des documents pédagogiques correspondants - l'envoi dans les pays intéressés d'un ou deux instructeurs français, pendant une durée limitée à 2 ans environ, qui doivent assurer le démarrage rapide des Centres en collaboration avec les Techniciens venus au préalable à Gurcy, qui sont appelés eux-mêmes à prendre complètement en charge la direction et le fonctionnement des Etablissements.

ii) Plans et programmes de formation appliqués - A la demande des Entreprises intéressées, l'activité des Centres s'est jusqu'à présent développée suivant un plan comportant essentiellement deux Cycles principaux de formation ou de perfectionnement : le 1er cycle dénommé "plate-forme de base des métiers de l'électro-mécanique", d'une durée d'environ 300 heures effectives est consacré à l'enseignement de base polyvalent alors que le 2ème cycle est un enseignement de spécialité d'une durée de 200 à 350 heures pour les métiers d'"électricien de réseaux", d'"électro-mécanicien de centrale" (hydraulique, thermique vapeur ou diesel) ou d'"électro-mécanicien de centrale diesel isolée et de réseaux".

Dans la plupart des Centres, ces deux cycles sont précédés d'un cycle d'"alphabétisation ouvrière et d'initiation technique", d'une durée variant entre 50 et 150 heures, destiné aux adultes analphabètes ou presque, pourvus ou non d'une qualification professionnelle. Enfin, le 2ème cycle est généralement prolongé par un cycle de formation ou de perfectionnement spécialisé au niveau "chef d'équipe" (durée : 80 heures) ou au niveau "chef de secteur" et "contremaître" (durée : 240 heures) pour des agents sélectionnés au cours des cycles précédents.

iii) Processus pédagogiques et techniques audio-visuelles utilisés

a. Formation et perfectionnement des ouvriers et agents de maîtrise - Comme à l'Ecole de Gurcy la formation dispensée est dictée par la nature des différentes fonctions qu'auront à assurer les stagiaires, jeunes ou adultes. Les enseignements pratique et théorique sont intimement liés et mettent en jeu un important matériel d'expériences, des films, maquettes, etc ... spécialement étudiés ; ils font appel aux aptitudes plus qu'aux connaissances acquises.

L'équipement des Centres permet aussi d'assurer le perfectionnement du personnel sur le lieu même du travail par l'emploi méthodique d'un matériel très complet conçu spécialement pour être transporté dans les Centrales et les Centres de distribution. Les instructeurs sont les ingénieurs et les techniciens d'exploitation intéressés qui, au préalable, ont reçu dans les Centres l'initiation pédagogique nécessaire. Le grand succès de ce type de perfectionnement mérite d'être souligné.

b. Alphabétisation ouvrière et initiation technique - Les objectifs de l'action entreprise par les Centres dans ce domaine sont les suivants : Motiver l'alphabétisation en l'associant à l'apprentissage du métier - Enseigner le vocabulaire technique de base (prononciation, lecture,

écriture) - Entraîner à l'usage du vocabulaire technique en associant les mots qui le composent aux réalités et aux phénomènes qu'ils représentent - Déceler les aptitudes permettant l'orientation des meilleurs éléments vers une formation d'un niveau plus élevé (ouvrier qualifié ou cadre de maîtrise).

L'équipement de la plupart des Centres qui ont été créés comprend le matériel et les documents nécessaires à l'application de la méthode dans les Industries électriques.

c) LOCALISATION DES ETABLISSEMENTS

Les 23 Centres et Instituts en fonctionnement (ou sur le point de l'être) sont implantés dans les Pays suivants : Tunisie (Tunis), Maroc (Casablanca), Cameroun (Douala et Edéa), Côte d'Ivoire (Abidjan), Mexique (Mexico), Brésil (Belo-Horizonte - Salvador - Porto Alegre - Campinas et Paulo Afonso), République Argentine (Buenos-Aires et Rosario), Vénézuëla (Caracas - Valencia - Puerto la Cruz et San Felix), Equateur (Quito), Pérou (Lima), Uruguay (Montevideo), Colombie (Bogota et Cali), Bolivie (La Paz).

Par ailleurs, 18 nouveaux Centres intéressant des Pays d'Amérique latine, d'Afrique, du Proche-Orient et d'Extrême-Orient sont actuellement en projet.

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DANS L'INTÉRÊT DES RÉGIONS PEU DÉVELOPPÉES

Point de l'ordre du jour : B.1

France

RYTHME DE CROISSANCE
DES POPULATIONS DU TIERS-MONDE
D'APRES LES RECENSEMENTS DE 1960-1961

Par Alfred SAUVY,

Les mémoires rédigés à l'intention de la Conférence des Nations Unies sur l'application de la science et de la technique dans l'intérêt des régions peu développées sont des documents de travail. Ils sont publiés tels qu'ils ont été présentés et les assertions et opinions qu'ils contiennent sont celles de leurs auteurs.

NOTES

1. Les mémoires choisis pour être présentés en séance générale pourront être obtenus à la Conférence dans les langues officielles suivantes des Nations Unies: anglais, espagnol, français et russe.
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RYTHME DE CROISSANCE DES POPULATIONS DU TIERS MONDE

par Alfred SAUVY

Jusqu'à la guerre, la connaissance des populations de l'actuel Tiers Monde était très sommaire. Quelques recensements grossiers ou évaluations donnaient l'ordre de grandeur des populations ; mais, sur leur croissance, leur natalité, leur mortalité, la nuit était à peu près complète. Bien souvent, on ne pouvait dire si le nombre des habitants augmentait ou diminuait.

C'est aujourd'hui, un lieu commun d'affirmer que ces populations sont en croissance rapide ; encore faut-il préciser le rythme de cette croissance, car les solutions économiques dépendent de ce rythme, de façon très sensible, par le caractère marginal des populations supplémentaires à intégrer, chaque année, dans l'économie.

Situation jusqu'en 1961

En 1950-1951, a eu lieu un recensement dans la plupart des pays du monde ; pour beaucoup d'entre eux, c'était le premier. Si précieuses que fussent ses données, il ne fournissait rien sur le rythme de croissance.

Celui-ci peut être connu par l'état civil, relevé des naissances et des décès. Mais, dans la plupart des pays du Tiers Monde, les déclarations ne sont que très partielles et comme le déchet est, de façon générale, plus élevé pour les naissances que pour les décès, l'accroissement ne peut même pas être évalué par un simple redressement du taux. Il faut opérer séparément pour les naissances et les décès, étudier avec attention des zones plus ouvertes à la statistique, et au moyen de multiples données, imparfaites ou incomplètes, parvenir à une estimation raisonnable. Travail délicat, que de faire avec de l'inexact de l'à-peu-près, mais travail indispensable.

Les statisticiens ayant beaucoup gagné en audace depuis une génération (mais aussi en savoir faire), il a été possible d'avancer, pour chaque pays, et tout au moins pour chaque région suffisamment homogène, un taux de natalité et un taux de mortalité, dont la différence donne l'accroissement naturel, généralement compris entre 1,5 et 3 % par an.

Les prévisions en "projections".

Les démographes ont été plus loin : Dès qu'ils ont eu connaissance suffisante du présent, ils en ont projeté les données fondamentales dans le futur, de façon à décrire les trajectoires possibles ou probables d'ici d'un demi-siècle.

Ainsi, non seulement les recensements de 1950-1951 ont fourni la première estimation vraiment sérieuse de la population du monde, mais ils ont permis de savoir quelle serait, en l'an 2 000, cette population, dans les hypothèses les plus vraisemblables, et par là de déterminer une zone dans laquelle se trouvera à peu près certainement le nombre des hommes de la planète, au début du XXI^e siècle.

Le recensement de 1960-1961

Ces prévisions assises sur la base de départ 1950, avaient pour première étape 1960. Il était intéressant, au terme de cette étape, de vérifier le bien-fondé des projections.

Le recensement entrepris, dans la plupart des pays, en 1960 ou 1961, devait donc apporter une intéressante information, non seulement sur l'importance de chaque population, mais sur son rythme de croissance.

Il faut parler simplement d'"information" et non de résultats décisif. Les recensements de la population sont en effet des opérations délicates, dont les résultats doivent, comme ceux de l'état civil et en liaison avec ceux-ci, être soumis à une sévère critique.

Premiers résultats

Les résultats n'étant pas tous connus, ni moins encore analysés et commentés, il n'est pas encore possible de procéder à un bilan général ; mais, d'ores et déjà d'intéressantes constatations peuvent être faites.

Donnons d'abord une vue sommaire sur les principaux pays d'Afrique et d'Asie qui se prêtent d'ores et déjà à un rapprochement entre prévision et recensement :

	<u>Prévisions pour 1960</u>	<u>Recensement</u>
	(en milliers d'habitants)	
Egypte	26 000	26 060
Maroc	10 800	11 626
Togo	1 160	1 140
Ghana	4 980	6 691
Angola	4 490	4 833
Mozambique	6 390	6 592
Afrique du Sud	15 200	15 841
Syrie	4 840	4 555
Turquie	27 500	27 829
Pakistan (1961)	92 200	93 832
Népal (1961)	9 400	9 388
Inde (1961)	417 000	434 885
Thaïlande	22 900	26 258
Cambodge (1959)	4 720	4 845
Indonésie (1961)	89 300	96 385
Philippines	24 400	27 456
Corée du Sud	24 200	25 000

Le chiffre de prévision concerne l'hypothèse moyenne admise par les Nations-Unies, mais, pour cette première étape, cette hypothèse coïncide à peu près avec l'hypothèse forte, c'est-à-dire ne comporte pas de réduction de la fécondité.

Sur 17 pays, représentant au total plus de 800 millions d'hommes, 15 accusent une augmentation sur les prévisions et 2 seulement une diminution, la différence est en moyenne de près de 5 %.

Cette constatation peut prêter, dans chaque pays, à trois interprétations :

- ou bien le recensement de 1960-1961 a été plus complet que le précédent, a permis de saisir des populations laissées de côté ou sous-évaluées et par suite représente mieux la population du pays.

- ou bien le recensement de 1960-1961 a surestimé la population, par doubles emplois notamment.

- ou bien le recensement est comparable à celui de 1950.

La seconde hypothèse est la moins probable ; si on avait, dans un pays, des raisons de la tenir pour bonne, il faudrait, pour l'objet qui nous intéresse, ne pas tenir compte de ce recensement.

Dans la première hypothèse, il faut rectifier le total de la population, mais non son rythme de croissance. Cette rectification portera naturellement aussi sur les prévisions. En outre, tous les nombres calculés par tête d'habitant doivent être réduits en proportion, en particulier les ressources agricoles ou alimentaires.

Dans la troisième hypothèse, c'est le rythme de croissance qui a été sous-estimé. Il faut donc rectifier à la fois ce rythme et les chiffres prévisionnels, y compris celui de 1960.

Reconnaître quelle est l'hypothèse la plus vraisemblable exige un travail délicat. Donnons les résultats de deux recherches importantes :

Extrême-Orient

M.H. Gille, des Nations-Unies, a étudié spécialement les pays d'Extrême-Orient, comparant les résultats du recensement non seulement aux prévisions des Nations-Unies, mais aux estimations officielles de la population à l'époque du recensement. Il estime que, le plus souvent, c'est la baisse de la mortalité qui a été sous-estimée ; par suite, il faut relever le rythme de croissance admis jusque-là. Voici les résultats de ses recherches pour le taux de croissance par an, entre les deux recensements :

	d'après l'estimation officielle	d'après le recen- sement 1960-1961	taux actuel
Pakistan	1,7 %	2,2 %	2,5 %
Inde	1,4 %	2,0 %	2,3 %
Thaïlande	2,0 %	3,0 %	3,2 %
Philippines	2,4 %	3,2 %	3,5 %
Corée du sud	1,6 %	2,9 %	3,2 %
Sarawak	1,3 %	2,5 %	3,0 %

Le rythme actuel est encore supérieur à celui observé entre les deux recensements. Ces corrections importantes vont obliger à réviser tous les plans de développement économique et culturel, rendant plus impérieux encore des investissements étendus.

Amérique latine

La Commission économique pour l'Amérique latine (C.E.P.A.L.) a fait procéder, par un démographe spécialisé, à une étude générale de la croissance démographique des pays d'Amérique latine, à la lumière du dernier recensement. Voici pour les principaux pays, la population prévue, pour 1960, par les Nations Unies et la population actuellement estimée à cette même date (milliers). Il ne s'agit que des états indépendants.

	Prévision des Nations-Unies	Estimation actuelle
Argentine	21 300	20 956
Bolivie	3 440	3 696
Brésil	67 100	70 600
Chili	7 070	7 627
Colombie	14 300	15 468

Pérou	10 500	10 857
Vénézuéla	6 760	7 331
Autres Etats indépendants	8 710	8 932
Amérique du sud	<u>139 180</u>	<u>145 447</u>
Mexique	34 200	34 988
Guatemala	3 790	3 765
Cuba	6 810	6 797
Haïti	3 560	4 140
Autres états indépendants	10 830	<u>11 109</u>
Amérique centrale-Antilles	<u>59 190</u>	<u>60 799</u>
Amérique latine	<u>198 370</u>	<u>206 246</u>

Ici, encore, on trouve un chiffre plus élevé (4% de plus) que celui prévu. Bien que, dans certains cas (Brésil, Chili, Haïti etc...), le recensement paraisse avoir été plus complet que celui de 1950, les résultats ont conduit, de façon générale, à réviser en hausse les taux de croissance admis jusque-là.

Voici comment ils se présentent pour trois périodes de 10 ans, (passée, présente, à venir), en Amérique du sud :

	<u>1945-55</u>	<u>1955-65</u>	<u>1965-75</u>
Uruguay	1.5	1.3	0.8
Argentine	2.2	1.8	1.7
Bolivie	1.9	2.2	2.5
Chili	2.0	2.4	2.4
Paraguay	2.3.	2.5	2.8
Colombie	2.7	2.8	2.9
Pérou	2.0	3.0	3.2
Equateur	2.9	3.2	3.2.
Brésil	2.7	3.3	3.0
Vénézuéla	3.6	3.7	2.9
Amérique du sud	<u>2.5</u>	<u>2.9</u>	<u>2.8</u>

Les pays ont été rangés dans l'ordre croissant des taux en 1955-65, c'est-à-dire actuellement. L'Argentine et l'Uruguay se détachent nettement des pays où la prévention des naissances ne joue pas un rôle important. Pour l'Amérique tropicale, le taux de croissance dépasse 3,1 %.

Les taux estimés pour la période 1965-1975 tiennent compte de la baisse certaine de la mortalité et d'une possible diminution de la natalité, par prévention des naissances. Selon les pays, l'un ou l'autre facteur l'emporte, le taux de croissance s'élevant encore dans les pays les plus attardés et diminuant chez les plus avancés; l'ensemble se traduirait par une très légère diminution du taux de croissance.

Voici maintenant les mêmes résultats pour l'Amérique centrale et les Antilles :

	<u>1945-55</u>	<u>1955-65</u>	<u>1965-75</u>
Cuba	2.2.	2.1	2.0
Haïti	1.6	2.2	2.6
Panama	2.8	2.7	2.8
Guatemala	2.9	2.9	3.1
Mexique	2.9	3.1	3.0
Salvador	1.9	3.1	3.2

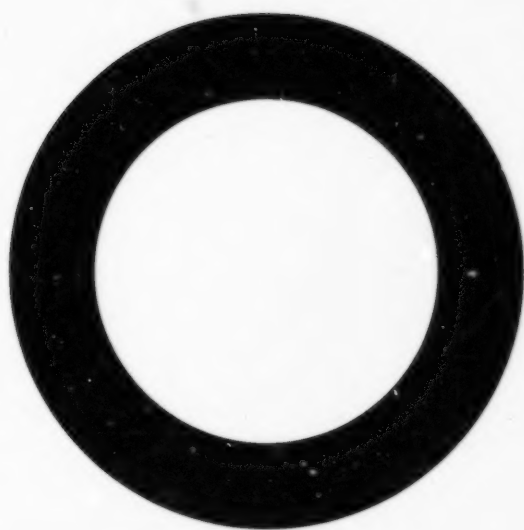
Honduras	2.8	3.4	3.5
Nicaragua	3.0	3.5	3.5
Rep. Dominicaine	2.9	3.5	3.5
Costa Rica	<u>3.2</u>	<u>3.9</u>	<u>3.5</u>
Ensemble	2.7	3.0	3.1

Le résultat final est peu différent de celui de l'Amérique du sud, mais le taux doit croître encore, l'évolution étant moins avancée. Des taux très élevés doivent encore être enregistrés dans les prochaines années.

Vue d'ensemble et conclusion

Non seulement la croissance rapide de la population du Tiers Monde doit se poursuivre encore pendant longtemps, mais le taux de croissance lui-même ne paraît pas avoir encore touché son maximum. Une croissance démographique de 3 % par an, qui semblait à peu près utopique, une génération plus tôt, est devenue aujourd'hui courante, dans la zone tropicale. Il faut rappeler que, pendant son grand essor démographique du XIXe siècle, marqué par de si fortes misères, l'Europe occidentale n'a guère connu de taux supérieurs à 1% par an et que les pays industriels de plus forte croissance, (E.U., U.R.S.S.) sont aujourd'hui aux environs de 1,5 %.

Le taux très élevé de croissance du Tiers Monde rend plus difficile le développement économique, et plus encore sans doute la scolarisation. Il importe maintenant de le traduire en "investissements démographiques" et d'en tirer les conclusions qui se dégagent pour la politique mondiale.





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FOR THE BENEFIT OF THE LESS DEVELOPED AREAS

Agenda Item:B.3

Brazil

EXPERIENCE OF THE STUDY GROUP
OF INDUSTRIAL PRODUCTIVITY, GEPI,
AT ESCOLA FLUMINENSE DE ENGENHARIA
(THE SCHOOL OF ENGINEERING OF THE STATE
OF RIO DE JANEIRO, BRAZIL)
IN THE DEVELOPMENT OF PROGRAMS FOR TRAINING
OF THE TECHNICIANS OF INDUSTRIAL FIRMS
IN METHODS OF ORGANIZATION

By Paul José PARDAL,
Engineer, Professor of the National School
of Engineering of Brazil and of the School
of Engineering of the State of Rio de Janeiro,
Former Director of the National Center
for Productivity in Industry and of the G.E.P.I.

Papers have been contributed to the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas as working papers for that Conference. They are published as presented by the contributors, and the contents and the views expressed are those of the contributors. (See notes overleaf.)

NOTES

1. Papers selected for inclusion in General Sessions will be available at the Conference in the following official languages of the United Nations: English, French, Russian and Spanish.
2. Papers selected for inclusion in Specialized Sessions will be available at the Conference in only one of the above official languages.
3. Summaries of all papers, as submitted by contributors, will be available at the Conference in the following official languages of the United Nations: English, French, Russian and Spanish.
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EXPERIENCE OF THE STUDY GROUP OF INDUSTRIAL PRODUCTIVITY (GEPI) AT ESCOLA PLUMINENSE DE ENGENHARIA (The School of Engineering of the State of Rio de Janeiro, Brazil) IN THE DEVELOPMENT OF PROGRAMS FOR TRAINING OF THE TECHNICIANS OF INDUSTRIAL FIRMS IN METHODS OF ORGANIZATION

by PAULO JOSÉ PARDAL

Engineer, Professor of the National School of Engineering of Brazil and of the School of Engineering of the State of Rio de Janeiro. Former Director of the National Center for Productivity in Industry and of the G.E.P.I.

I - - What type of agency would be suitable for the development of a drive for a higher productivity?

1. The situation prevailing in Brazil at the present time is featured - insofar as concerns education for technological development - by an acute shortage not only of medium-level engineers and technicians in industry but also, and to an even greater degree, of personnel capable of training existing labor in the methods of organization needed for increased productivity.
2. Here, we describe the main features of the experience gained in three years's activity of the Study Group of Industrial Productivity (GEPI) at Escola Pluminense de Engenharia (The School of Engineering of the State of Rio de Janeiro).
3. The purpose of the GEPI is to carry out effective action aimed at increasing industrial productivity through:
 - (a). Dissemination of methods for increasing productivity in industry, through articles, talks, films, news-stories in specialized magazines, etc. GEPI has already released some half a dozen articles and presented several dozen talks on this subject;
 - (b). Advanced training courses in methods of organization for increased productivity, for engineers and technicians working in industry. GEPI has so far held 30 courses (of an average duration of 40 hours each) in which a total of 1 000 trainees have participated;
 - (c). Technical assistance in the practical application of the methods taught, as a form of follow-up for the ex-pupil during his first actual work. This program also serves to provide examples and case histories for use in future course of the same type. GEPI has applied this method in about twenty firms so far;
 - (d). Measurement and appraisals of productivity, and studies and research on improvement of productivity and the factors underlying such improvement, with a view to providing better guidance for GEPI's activity. GEPI has not yet been able to implement this sector of the program, due to lack of resources and unavailability of experts.
4. The School's training courses benefit from the closer contact with industrial firms in the neighborhood inasmuch as practical examples can be obtained in local industries, which are already opening their doors to us for student tours and even study periods within industry. The industries are even starting to give

study grants to last-year students in the Industrial Engineering courses, so as to bring them into more intimate contact with their work and provide them with better training. We aim to develop such activities more and more and even make a work period in industry an obligatory feature of the Industrial Engineering Course during at least the last year of study. Heretofore it would not have been easy to do this in view of the lack of contact between the University and the industrial managements, especially those of the small- and the medium-sized firms which are precisely those most needing the technical assistance of a Productivity Center because they often are not in a position to employ an engineer on a full-time basis.

5. With a view to establishing a better tie-in between industry and the management of the Productivity Center, we recommend that such management be in the hands of an administrative board composed of representatives of the University and industry, in equal numbers. We feel it is important to have a representative of the state government. The latter should, of course, be someone in close touch with the industrial and economic activities of the state.

6. Hence GEPI is run by an Administrative Board composed of the following members: the Director of Escola Fluminense de Engenharia; the Coordinator of GEPI; the Professor of Economics and Organization of the Escola Fluminense; one representative of the Federation of Industries of the State of Rio de Janeiro; one representative of the government of State of Rio de Janeiro; one representative of the companies participating in GEPI's activities.

7. The Administrative Board studies and decides on matters of major importance brought to its knowledge by the Coordinator. The latter acts as Executive Director inasmuch as he is in charge of all work necessary for the technical and administrative operations of GEPI. He is assisted by a permanent team consisting of a secretary, a typist and two engineers, who follow up the courses given and do some practical work in the industrial firms. Records of the latter work are written up and used as "case histories" in the courses. Brazilian and foreign professors and industrial technicians are also invited to give the specialized courses.

8. Another advantage derived from the Board resides in the assurance provided that the activity of the Productivity Center will be of a practical type, avoiding any possible theoretical and academic tendencies on the part of university professors. As a matter of fact, it should be stressed that few universities in Brazil would be in a position to embark right away on a program of courses, seminars and technical assistance to industrial firms, in view of the shortage of instructors familiar with modern methods of industrial organization and the aggressive techniques used in giving courses for industrial management, often attended by men of mature age, who have lost the habit of attending courses. In chapter V we give a suggestion on proper training for instructors.

9. The basic Set-Up of a Productivity Center: The action of a Productivity Center should commence with the Dissemination of basic notions regarding Productivity and how to increase it, as well as the methods most used in organizing and managing industrial firms. This is done through articles in the press and in specialized magazines and talks before professional associations and in companies. Whenever possible, special training films are shown.

10. Once a few industrialists are convinced of the need for finding a solution to problems of application of the methods envisaged, it is then necessary to proceed to the phase of Training company administrators and technicians in the methods in question. This training is done in practical courses and represents the major activity of a Productivity Center. It has a "multiplying" effect in view of the fact that one instructor can usually transmit information to a group of 20 to 40 participants.

11. As a sequence to these courses, it is of fundamental importance that the industrialists be induced to apply the methods presented, even though on an elementary basis. This calls for Technical Assistance, which consists of following up the participants in the course so as to encourage them and perhaps even

aid them in implementing in their plants the methods taught. This phase is the crowning result of the Productivity Center's action. Unfortunately, it can be carried out only in a somewhat restricted manner. If it were our purpose to extend it, the Productivity Center would become transformed into an overall office for the organization of industrial firms, which is not, of course, appropriate.

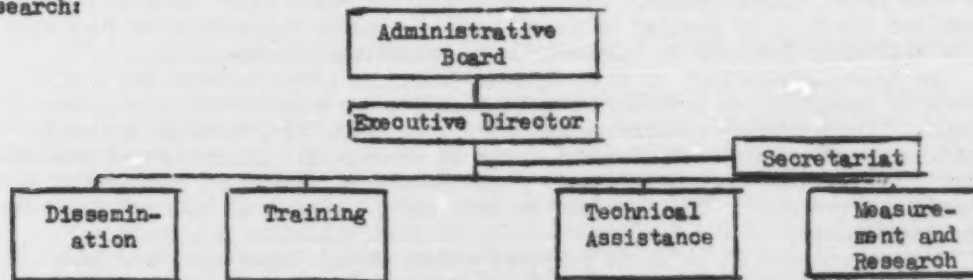
12. Finally, after a certain period of operation and after winning the confidence of a certain number of local industrialists and being able to rely on information requested of them, we can enter into another fundamental aspect of a Productivity Center, namely, Measurement of productivity and comparisons with other firms in the same sector, and hence Research into the causes of such instances of low productivity as are observed in the firms in question. This makes it possible to continue the action of the Productivity Center in a rational manner, extending it to other firms not yet served. This is done in every case through the above-mentioned phases of dissemination, training and technical assistance.

13. It would, of course, be an ideal state of affairs if this work could start with a broad fact-finding survey, to measure Productivity and look into the causes of deficiencies encountered. However, our experience in this respect has shown that it is impossible to commence the activity of a Productivity Center by calling upon industrialists to open up their firms and cooperate by supplying the necessary information. The reason for this is that such industrialists know nothing about the persons in charge of such a newly-introduced Productivity Center. After a few years of contact, through efficient efforts on the part of the Center, this state of affairs will no longer prevail.

14. An exception to the above remarks would be the case in which the Productivity Center is supported by a government agency of obvious prestige or when the industrial firms obtain certain advantages from participating in the activity of the Productivity Center. As a matter of fact, some countries in Western Europe have issued decrees and instructions favoring efforts aimed at increased Industrial Productivity, whereby special credits, exemption from certain taxes, etc., are granted to firms adopting the measures recommended by official Productivity agencies. Other forms of action are the offering of salary bonuses, the establishment of organization services, etc.

15. Although the adoption of such general measures on the part of the government is of the greatest importance, it would seem to us that they ought to be preceded by a small-scale action on the part of regional Productivity Centers, in order to train a few national technicians who may then— thanks to the experience they have acquired— be able to direct action on a broader basis, under government sponsorship. If this broader action were to be commenced directly it would be necessary to resort to the use of foreign experts, due to lack of local know-how. The success of such an undertaking would be somewhat doubtful, as the probable reaction on the part of industrialists in the region would be unknown.

16. Finally, we present a simple type of organizational chart for a Productivity Center, reflecting the four main sectors of activity discussed above, namely: dissemination, training, technical assistance, and measurement and research:



II- - Type of action that is recommended

17. It is of fundamental importance that the activity of the Productivity Center be of an eminently practical nature, right from the initial phase of dissemination. That phase, incidentally, is the most important of all, because the confidence of the industrialists will be won or lost at the outset dependent upon how effectively or otherwise it is done. A drive which begins with talks and full-length articles of substance, but which does not take into consideration the numerous day-to-day problems of a company administrator, will fail to attract attention. Such a campaign would be fated to become a mere movement by intellectuals and would not reach the medium-sized and small firms which are the main targets of Productivity campaigns (inasmuch as large companies often have their own special departments dealing with methods of organization).
18. The campaign should be disseminated in simple, readily understandable terms, preferably using examples from local factories and employing slides and films to point out practical results already obtained.
19. In the training courses it is even more important to maintain this practical aspect, by abundant use of audio-visual means such as films, tests with "urns" and "dice", small-scale models of building lay-outs, slides, etc., as described in a paper by the author presented to this Conference under the title "Audio-Visual Aids used for training Industrial People in Organization for Productivity Increase".
20. In providing technical assistance to industrialists it is important that the Productivity Center specialist assist them in solving practical problems so as to provide easy, immediate results rather than guiding them towards the solution of more important complex problems harder to solve, which might lead them to abandon the proposed course of study.
21. Selection of the technicians capable of carrying forward the campaigns of the Productivity Center thus become a somewhat delicate problem. Besides having sound basic university training, which is often acquired along academic lines, it is essential that such personnel have a pragmatic and "short-range" approach aimed at the rapid obtaining of palpable results supporting the operations of the Productivity Center. The management of the Center must thus operate along almost commercial lines, endeavoring to convince and satisfy its "clientèle", namely, company management. Only thus will the Productivity Center justify its existence and be assured of continuing operation, thanks to the contributions made by the industrialists. It can readily be understood how hard it is to find persons of real ability, having both the theoretical knowledge needed and at the same time a practical turn of mind and a--so to say-- commercial concern with having the Productivity Center be able to make its way without official subsidies. This, we repeat, is the acid test of its true usefulness.
22. Our experience with the GEPI shows that a good way to get instructors is to hire young engineers who have had a few years' experience in industrial firms (so that they have not yet reached management positions which would make it hard for them to be reassigned). Such engineers should be given a few months' training in practical courses and work assignments after which they will be in a position to give short (or "introductory") courses and direct the practical work done by the participants. It is important for their first work to be done in smaller towns or in special courses aimed at smaller companies, so that they may be gradually prepared to take over more demanding duties.
23. The "ground-breaking" or disseminatory lectures given by GEPI cover the methods of organization necessary for increased industrial Productivity. For instance, "Industrial Productivity and how to increase it", "Simplification of industrial work", "Time and movement study in connection with increased Productivity", "Statistical control of quality and avoidance of waste", "Production planning and control", "Training within industry", "Industrial safety" might be suitable subjects.
24. We have endeavored to avoid subjects which, though important, are less technical and objective in nature, such as: human relations, the task of leader-

ship, principles of company management administrative science, etc. Other basic points connected with specialized training of labor and firemen have also not been covered because such subjects are already handled in Brazil by a very well equipped agency, the SENAI (National Industrial Apprenticeship Service).

25. We mention beneath the main courses that have already been given a number of times by GEPI:

- (a). Industrial Productivity. 20 hours;
- (b). Introduction to Company Management. 20 hours. Course covers main problems in the following sectors: personnel, marketing, finance and accounting, materials and purchases;
- (c). Work-simplification. 40 hours;
- (d). Time study. 30 hours;
- (e). Cost accounting. 30 hours.

III - Results achieved by GEPI

26. The participants in the courses receive a certificate provided they meet the following requirements: 80% attendance; passing of a final examination; presentation of a report on applications of methods of simplification techniques in their own companies. Dozens of instances of improvement have already been obtained, with increases in productivity by a worker or by a machine often to the extent of 100 to 200% and substantial increases in annual profit up to as high as US\$10,000 in certain cases. In a special film and a series of articles prepared by the GEPI a number of these improvements carried out by industrialists taking the courses are actually shown. In view of the fact that these are simple problems which can be cleared up in about a week, it can readily be understood how important an agency spurring the work of a Productivity Center can be from the point of view of economic development.

27. It should be mentioned that the "Industrial Productivity" course given by GEPI appears to be the most suitable means for starting a regional campaign, in view of the simplicity and universality of the subjects dealt with. It furthermore introduces in a methodical manner a number of basic concepts of industrial life: The general organization of the company and simplification of its operations; decisions based on the theory of statistical inferences (the Ratio Delay method along with statistical control of quality). Such a course thus opens the mind up for other courses which may perhaps be even more useful to the economy of the underdeveloped countries, especially those whose goal is primarily increased productivity by capital (economic and financial analysis of companies, industrial accountancy, etc.).

28. In the underdeveloped areas, where under-employment is the rule, courses teaching methods for increasing productivity of labor (such as those on Time and Movement Study) must be used in moderation and accompanied by a series of measures for lessening the disadvantages which might arise from possible releasing of labor, such as an undertaking on the part of the industrialists to utilize such labor for expansion of the firm, and so on. In view of the briefness of this report, we shall not go into the need for overall economic planning including the integration of plans for increased productivity and their consequences, such as the releasing of labor, etc. It might be added that GEPI's pilot-work as described is quite limited and will by no means change the existing economic and social set up in the region in which it operates.

IV - I Congresso Fluminense de Produtividade (First Productivity Congress of the State of Rio de Janeiro)

29. As a result of GEPI's activity in the state of Rio de Janeiro, industrialists in the city of Petropolis proposed that a Productivity Congress be held there. The first congress of its type in Brazil, it was attended by about 100 technicians and industrialists. They discussed and approved several dozen recommendations which appear in the "Annals of the First Fluminense Productivity Congress."

V - Plans for spreading this activity throughout the whole of Brazil

30. The above-mentioned Congress on Productivity was attended by the Directors of the eleven Productivity Centers established by the Federations of Industries

of the States, which are in turn coordinated by the National Center for Productivity in Industry (CENPI), an agency of the National Confederation of Industry. At the congress there was a discussion of the plans of action for 1962, but it was found impossible to get them implemented. We shall nevertheless summarize the main steps we feel necessary for the development of a campaign for increased Productivity throughout the whole of Brazil:

(a). Establishment of a pilot-agency to carry out limited regional action, with a view to: training a few technicians, checking the reaction on the part of the industrialists, preparing and trying out the necessary teaching materials: texts, audio-visual materials, etc. (This stage has already been carried out in Brazil with the establishment of GEPI in 1959. Effective assistance was obtained in this respect from the French Technical Cooperation Service, which sent five missions of experts to give courses);

(b). Formation of an Advisory Council to organize and coordinate official support for the establishment of autonomous Regional Productivity Centers. As already mentioned, we feel this Council ought to operate out of the Ministry of Education and that the Productivity Centers ought to be located in the local Universities;

(c). Holding of an intensive one-month course at the pilot-agency, in order to train TWI instructors and Executive Directors for the Productivity Centers to be established in the Universities interested in participating in the program;

(d). Organization of a one-week Seminar in each Productivity Center in course of organization, to be given by a technician of the pilot-agency, so as to have some discussion with the local faculty and industrialists on how to organize and run the Center. This will facilitate the task of the Executive Director. At the same time the future instructors and technicians for the Center could be selected for training in intensive courses in the pilot-agency. (Such courses should already have been planned by this time, in order to permit detailed discussion of the program and goals intended);

(e). The Productivity Centers would commence their action with TWI courses, given within a small group of companies, so as to provide an effective follow-up which would make it possible after 6 or 12 months to appraise the overall improvements obtained at the company level as a result of this action;

(f). Organization within the pilot-agency of six intensive courses lasting one-month each for training instructors in the principal methods to be made known at the outset by the Productivity Centers: organization of production; commercial organization; financial administration and accounting; personnel problems, etc. Each Productivity Center would send:

(i). An experienced technician to follow each of the courses and prepare to hold talks and seminars on his return, thus ensuring short-term action. It is of interest that such technician be a member of the University faculty so that his future courses may also derive benefit from this action.

To hold these courses the pilot-agency would have to avail of both Brazilian and foreign experts. Private Brazilian consultants would thus enter into contact with professors and technicians from the States, thus making it easier to hold courses there later on, and to cooperate with the action on the Productivity Centers.

(ii). A few young engineers or economists should then establish coordinated action so as to create a broad course on company administration. Participants would then have six months of practical work after which they would return under contract to their Productivity Centers qualified to hold courses and provide technical assistance on a long-range basis, with preparation through TWI courses, talks and seminars already held in the region. Some of these young specialists might also be selected to undergo finishing courses under study grants abroad.

31. In the chart below we show the main activity to be carried out in the

Center (headquarters of the pilot-agency and Advisory Council) and in the States or Regions, during the four-year period felt necessary for the establishment of the Productivity Centers on an autonomous basis i.e., with technicians of their own. About the middle of the fourth year of operation of this plan, a National Productivity Congress would be held, experience gained would be discussed and the foundation laid for continuity of action.

32. The above summarizes the main lines of approach we feel necessary for the development of a Productivity Campaign in Brazil. This outline might also be used as a basis for a discussion on how to carry out such a plan in countries in course of development, featured by a shortage of engineers and technicians and by geographical size, an obstacle to centralized activity.

LOCATION TIME PERIOD	IN STATES OR REGIONS	AT CENTER (headquarters of pilot-agency and Advisory Council)
P I R S T Y E A R	Commencement of discussions between instructors, technicians and industrialists at Productivity Center. Holding of one-week seminars for setting up of Productivity Centers.	Formation of Advisory Council Preparation of general directives for action. Consultation with Universities Preparation and holding of intensive courses for Executive Directors of Productivity Centers and instructors for TWI.
S E C Y O E N A D R	Commencement of TWI courses with follow-up. Commencement of talks and seminars by local instructors and technicians who took the one-month course and with...	Hiring of technicians and preparation of materials necessary for holding six intensive courses planned. Holding of the courses in question.
T H I R Y E D A R	possible cooperation by private advisory personnel with whom they have established contact during the courses taken. Commencement of local action by technicians trained during a period of twelve months, at the pilot agency.	Commencement of practical work so as to complete training of future technicians of Productivity Centers. Preparation for National Productivity Congress starts.
F O Y U E R A T H	Preparation of material for the Congress. Discussion on conclusions of Congress and preparation for greater expansion of regional activity.	Congress held Printing of Annals and preparation of new program to provide continuity of action.



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PLAN FOR THE MOBILISATION
OF THE AVAILABLE LABOUR FORCES
IN COUNTRIES IN THE PROCESS OF DEVELOPMENT

By G. ARDANT,
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Papers have been contributed to the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas as working papers for that Conference. They are published as presented by the contributors, and the contents and the views expressed are those of the contributors. (See notes overleaf.)

NOTES

1. Papers selected for inclusion in General Sessions will be available at the Conference in the following official languages of the United Nations: English, French, Russian and Spanish.
2. Papers selected for inclusion in Specialized Sessions will be available at the Conference in only one of the above official languages.
3. Summaries of all papers, as submitted by contributors, will be available at the Conference in the following official languages of the United Nations: English, French, Russian and Spanish.
4. Papers and summaries will not be available for general distribution in advance of the Conference. They will be published in advance in limited quantities only for the use of delegations of participating governments and of other authorized participants. Post-Conference publication and general distribution of the Conference Proceedings will follow United Nations practices as laid down by the United Nations Publications Board.

by G. ARDANT, Inspector General of Finance.

Present methods of assistance are proof of their own ineffectiveness. It is only by facing up to their problems themselves that developing countries will solve them. In view of the huge extent of their needs, however, they can only succeed if they draw on a vast mass of unused resources. But this mass exists: it is under-employment. The use of this immense potential resource, i.e. the mobilisation of the available labour forces, is an action which the science of economics not only demonstrates as feasible, it also indicates the method to be used. The results of the analysis are confirmed by experiments which the author has been able to follow. These experiments have been on too small a scale but it still is possible to reach some general conclusions. This plan of action, which the industrialised countries must facilitate, can be the most powerful contribution to the elimination of under-development.

I. BASIS OF THE PROPOSED SYSTEM

A. THE UNDER-DEVELOPED COUNTRIES ARE, ABOVE ALL, UNDER-EMPLOYED COUNTRIES

If it were not for the payment of unemployment benefits and through the reading of statistics, this under-employment, because of its very nature, tends to be forgotten.

To arrive at an idea of its extent it is insufficient merely to add together the European type of unemployed proper, i.e. workmen who have lost their jobs and those who have never had regular work, i.e. a large proportion of the inhabitants of the shanty towns. The main mass of the "unoccupied" consists of seasonally unemployed agricultural labourers who only have about 100 days' work a year with proportionate income. This is not all; to this visible unemployment must be added the disguised unemployment observed by agronomists and sociologists in the Mediterranean areas as well as in Asia and South America.

The best method of measurement consists therefore of comparing the existing labour force with that which should be required, taking into account the methods in use, for the actual production achieved.

When such inquiries have been carried out it has been discovered that the effective employment is barely higher - and sometimes lower - than 50% of the available labour force in country districts. F.A.O. experts have evaluated effective employment at:

55% in Spain
45% in Portugal
55% in Morocco
36% in Southern Italy, etc.

Other inquiries show a similar situation in Asia. It was estimated in India, in 1954, that, on average, the agricultural population worked for 218 days a year; in Pakistan the excess of manpower in agriculture was evaluated at 56%; in the Philippines half the workers on the land had 75 days' work a year, etc.

Similar phenomena have been observed in Latin America.

Disguised unemployment also exists in industry, where it shows up as low productivity, half, a third and sometimes less than European productivity; it also appears in a third condition, in which it is shown by the very large number of small businesses so characteristic of the under-developed world.

B. THE ELIMINATION OF UNDER-EMPLOYMENT

This would allow considerably increased capital investment. It is possible to evaluate at several hundred million the number of men who could devote at least a hundred days' work a year to capital investment. Even if it were only of a low level of efficiency, the value of this work would represent double all the money spent on what is known as "aid to insufficiently developed countries".

It would abolish the resistance which productivity policies inevitably encounter from trades unions, the majority of workmen, peasants, employers and even governments themselves which, because of under-employment, have had to prescribe the least productive methods.

It would be a stabilising social, and therefore political, factor; it is a fact that areas of marked under-employment are regular trouble zones with frequent revolts and consequent instability.

The first goal of any policy of economic development must be to put this mass of unemployed to work on capital investment on a large scale.

II. BRIEF DESCRIPTION OF THE PROPOSED SYSTEM

The obvious solution comes up against a series of objections put about in the name of the science of economics, material and administrative techniques and even sociological conditions. However, more detailed scientific analysis shows how each of these objections can be overcome.

A. The main objection, an economic one, can be summed up as follows:

The wages of the unemployed given work under the system will represent an enormous additional purchasing power which, pending the fruits of the capital investments, will not be complemented by an increase in consumer goods. This unbalance means inflation.

.../

It is, however, possible to escape this danger if the new workers receive no salaries - it is feasible to avoid paying them salaries if they work for their own profit - if the peasant improves his land or if the people of a village clear, retimber or irrigate their common land. Encouragement alone is then sufficient, the gratuitous supply of materials (e.g. cement and saplings) together with a relatively small outright subsidy.

This method is practicable because, in all countries in the process of development, there is a vast amount of work which can be accomplished by the peasants themselves, such as stone clearing, weeding, clearance of uncultivated land, protection against erosion, and that mass of capital investment covered by small and large water utilisation projects.

- B. By the same means, a second objection is countered, i.e. the lack of technicians. Only simple work is concerned, which the peasants themselves can perform without modern equipment and without technicians.
- C. The simplicity of the work allows the use of local administrative staff, from amongst those already performing such tasks; the very fact that the subsidy is in kind or in the nature of a lump sum considerably simplifies control. This presupposes very extensive decentralisation; i.e. a reaction against the "bureaucratic centralisation" so well known in all countries and in all systems of government.
- D. It goes without saying that this method would not allow the implementation of all the capital investment projects required by an under-developed country. Although the carefully planned large scale capital investments such as large dams, modern factories, etc. would require modern equipment and expert technical assistance, there would still be a vast number of small schemes which could be decentralised and carried out by the villagers to their own benefit and using local resources.
- E. The direct result of an economic analysis, this solution also follows sociological precepts: it aims to react against the system of two separate economies and against the unconcern of the rural masses who refuse to take any interest in progress brought to them from outside and which they feel is none of their business. By this system it is their own initiative which is applied towards known goals which are easy to understand, so that it is this initiative which is the starting point of their own development.
- F. Under certain social systems, in which all the land is owned by the big estates or where it is rented in such a way that the farmers cannot benefit from their efforts at improvement, this method may be difficult to put into operation. In such a case the mobilisation of the labour force will have the important result of making the need for social reform evident and of showing up the absurdity of a system which prevents any progress in productivity.

G. While avoiding the creation or accentuation of unbalance between purchasing power and goods available, efforts must be made as soon as possible to increase the quantity of goods produced. This is the equivalent of saying that the work carried out must consist exclusively of real capital investment, i.e. it must be aimed at creating production capability; a simple criterion can be applied; the work must be the creator of employment not only straight away but also in the future. Thus, work on town-planning is rejected but irrigation work is accepted.

H. Real capital investment need not necessarily only be material. Where the mass of unemployed is unsuited to land improvement, other methods may be envisaged. For example, trade training centres could be set up near shanty towns, in which training would be given to the future bricklayers who will build the factories and to the future workmen who will work in them; future foremen and overseers would be selected and other vocational abilities would be detected.

I. One of the difficulties of putting the unemployed to work is the unbalance between the extra requirements of hungry men and the foodstuffs available. Economic analysis suggests making available foodstuffs surplus to requirements elsewhere as a means of facilitating the starting of work. Such a procedure is not essential, but is at least desirable.

Various experiments confirm this analysis, even down to its details.

III. EXPERIMENTS CARRIED OUT

I will only mention the experiment carried out by the Chinese Popular Republic as a reminder since I have not personally observed it and because some may fear its connection with the whole economic system of that country. It is nonetheless an undoubted fact that it is to the mobilisation of previously unused labour forces that China mainly owes the economic progress it has been able to achieve.

Neither will I deal with the experiment of the community development programmes practised in many countries, notably India on a particularly large scale, because they had misconstrued the conclusions of the economic analysis, by giving great importance to social work, such as building halls for meetings and providing sports fields, which result neither in additional production nor in future employment. The Indian government itself has recognised this error.

In North Africa, the schemes implemented are worthy of being called scientific experiments. Although the author of these words has never ceased to encourage the governments concerned, it has not only been with the object of meeting their own problems, but also in order that lessons of wider importance might be learnt.

Three experiments have been carried out.

In Morocco, a preliminary trial was carried out in a small part of two provinces (MARRAKESH and AGADIR). A larger scale effort has been in

progress since 1961 under the name of "National improvement" with between 70,000 and 80,000 men employed.

In Tunisia, since 1960, all the unemployed are theoretically offered work and, at peak periods, there are about 200,000 men at work on construction projects.

Main lessons learnt from these experiments

- A. No compulsion has been necessary. The work is voluntary and, in certain provinces in Morocco, I have noted that tribes which had not been able to take part were urgently asking to be included. The allowance paid to each worker, about 400 francs a day in Morocco and a similar amount in Tunisia, and therefore less than a true salary, is undoubtedly higher than the average income in these areas. It would, however, be feasible to reduce this allowance wherever the work clearly helps the peasants; in the province of Quarzazate they have been satisfied merely with the free supply of the necessary equipment.
- B. The shortage, and even the complete lack, of technicians has nowhere been an insurmountable obstacle. In the Southern provinces of Morocco and Tunisia the peasants, led by the local authorities, have succeeded in carrying out a host of cementing tasks so that the reduction in water losses has doubled the effectiveness of irrigation canals and small dams; orchards have been planted, slopes have been treated against erosion and land has been cleared and retimbered.
- C. Such work, of undoubted economic value (in some cases output has been trebled), is only a small proportion of what should - and could be - done by this method.

In North Africa, the work on erosion prevention alone, the building of banks and tree-planting, would be sufficient to absorb all available labour for many years.

In Morocco, the area of land to be retimbered, protected and brought into production is generally estimated at about 3,000,000 hectares. So far, however, only 14,000 hectares a year have been dealt with. With 230,000 workers, 100,000 hectares, or even more, could be treated.

In the same country minor water projects could enable, by drainage, irrigation and proper use of rain water, 3,250,000 hectares to be improved and this would involve the employment of 260,000 workmen for 10 years.

These efforts are, however, only a part of the capital investment necessary to the country - investments which can be achieved by the people themselves.

Examination of Algerian and Tunisian data on the subject leads to similar conclusions.

- D. Mistakes have been made. Above all they consist of work carried out, in certain provinces, on town-planning and the construction of roads of doubtful value. The shocked reaction of the peasants at such expenditures is itself significant. These mistakes can easily be corrected.

- E. It has been easy to vary the numbers on construction work to fit in with the agricultural work, clearly demonstrating the feasibility of efficient use of seasonal unemployment.
- F. I, personally, saw that the construction projects provided first class "on the job" training for prospective foremen and administrative assistants.
- G. Extensive decentralisation has shown itself to be the key to success. It was thus that Tunisia carried out the biggest experiment. Morocco's unwillingness to delegate power to provincial and local authorities explains why her two experiments remained on a small scale.
- H. In not hesitating to make her administration more flexible and by controlling the financial arrangements (reducing the allowances) Morocco could mobilise ten times as many men, or about a million, i.e. all the country's unemployed, for six months. Such a result could be achieved almost immediately, i.e. within a few months.

This general idea can be put into effect not only throughout North Africa (Algeria in particular), but also in the whole Mediterranean basin (a study on the subject in the Italian paper Mezzogiorno has further convinced me), the whole of Africa (experiments have been tried, but much too timidly), in Asia and in Latin America. In all these countries, indeed, huge numbers of unemployed are living alongside vast areas of waste land which could be transformed by the simplest forms of capital investment, using equipment already to hand.

IV. PARTICIPATION BY THE RICH COUNTRIES

The experiments which have been described show that the rich countries could make a very simple, low cost and effective contribution to this economic development.

Part of the remuneration for the construction workers in Morocco and Tunisia was in kind; a few kilogrammes of wheat or 1.6 kilogrammes of semolina.

This wheat and semolina, however, came from United States surpluses and had been made available to the Tunisian and Moroccan Governments which, instead of simply handing them out, "transformed" them into capital investments.

Why not make this procedure general? I propose that all existing surpluses (except where it is felt that they need to be kept in reserve against emergencies) be made available to Governments which undertake to use them in the mobilisation of labour forces for productive capital investment.

This method would give rise to the objections which are regularly produced against the use of the surpluses of the rich to feed the poor. This rush of surpluses would, however, not upset normal business because it would correspond to new requirements. The recipients would not be enticed away from personal effort, since such effort would, on the contrary, be the requirement for the allowance.

A contribution of this nature is not essential to the mobilisation of the available labour force; it would nevertheless provide very definite support to what is the prime requirement of economic development.

CONCLUSION

As the precursor of progress, the mobilisation of labour will not, of itself, solve all the problems of an insufficiently developed country. It does not do away with the need for training for the elimination of privilege and for proper planning. It does, however, bring powerful support to a policy of economic development. Much more, this offer of work to a large number of unemployed will be an incitement to other reforms. Since fully effective use of manpower remains difficult as long as proper arrangements for full employment have not been made, this mobilisation makes a policy of increasing productivity possible. It brings out clearly the need for various reforms; it awakens the spirit of initiative and, through work in common, it lays the foundation of co-operation. The only individuals who can think of opposing this method are those leaders who rely on opposition to progress to maintain themselves in power. For this reason it is important that such an attitude should not be encouraged by the experts and scientists, but that these, on the contrary, should stress the feasibility of, and the need for, offering constructive work to all those who wish to improve their lot.



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